Note remarks

Test sheet : LIE 5,6 a
Edition : 22.05.92
Replaces : 11.91
Test oil : ISO-4113

Combination no. : 0 400 874 238

Injection pump

Pump designation : PES4A95D41ORS2685 EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1C2187

L

Governer no. : 0 420 232 387

Customer-spec. information Customer : LIEBHERR

Engine : D904 NA

1st version kW : 90.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

 $\times$  Length mm : 6.00 $\times$ 2.00 $\times$ 600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 975

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 415.0 Rack travel in mm : 6.6...6.8 Del.quantity cm3/ : 1.7...2.1 100 s: (1.4...2.3)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800 Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 975

Del.quantity : 119.0...121.0 1000 : (117.0...123.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 90...98

Testing: 1st rack travel in: 11.20 Speed rpm : 1015...1025 2nd rack travel in: 4.00 rpm : 1030...1060Speed 3rd rack travel in: 4.00 rpm : 1070...1090 Speed 4th rack travel in: 1230 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 65...73 Setting point w/out bumper spring rpm : 415 Speed Rack travel in mm: 6.2 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 415
Rack travel in mm : 6.10...6.30
Rack travel in mm : 2.00 Speed rpm : 535...595 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 975 Rack travel in m: 12.20...12.30 2nd speed rpm : 500 Rack travel in m: 12.20...12.40 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.20 Speed rpm : 1015...1025 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm : 415 Rack travel in mm : 6.60...6.80 Del.quantity cm3/: 17.0...21.0 1000 s: (14.5...23.5) Spread cm3 : 3.501000 s: (5.50) Remarks:

Note remarks

Test sheet : LIE 5,6 A15
Edition : 22.05.92
Replaces : 02.92
Test oil : ISO-4113

Combination no. : 0 400 874 238R

Injection pump

Pump designation : PES4A95D410RS2685 EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1C2187

Governer no. : 0 420 232 387

Customer-spec. information
Customer : LIEBHERR

Engine : D904 T

1st version kW : 90.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference 'CS : 4.00...5.00

BASIC SETTING

1st speed rpm: 975

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 415.0
Rack travel in mm : 6.6...6.8
Del.quantity cm3/: 1.7...2.1

100 s: (1.4...2.3)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 975

Del.quantity : 119.0...121.0 1000 : (117.0...123.0)

Spread cm3 : 3.50 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 90...98

Testing: 1st rack travel in: 11.20 rpm : 1015...1025 Speed 2nd rack travel in: 4.00 rpm : 1030...1060 Speed 3rd rack travel in: 4.00 Speed rpm: 1070...1090 4th rack travel in: 1230 Speed riom : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 65...73 Setting point w/out bumper spring nom : 415 Rack travel in mm: 6.2 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 415 Speed Rack travel in mm : 6.10...6.30 Rack travel in mm: 2.00 rpm : 535...595 Speed TORQUE CONTROL Torque control curve - 1st version mpm : 975 1st speed Rack travel in m: 12.20...12.30 2nd speed rpm : 500 Rack travel in m: 12.80...13.00 3rd speed rpm : 800 Rack travel in m: 12.80...13.00 4th speed rpm : 900 Rack travel in m: 12.40...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Speed : 500 rpm Del.quantity cm3/: 114.0...120.0 1000 s: (111.5...122.5) Speed : 800 rom Del.quantity cm3/: 125.5...128.5 1000 s: (123.0...131.0) BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 11.20 Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm: 100

A04

Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm : 415

Rack travel in mm : 6.60...6.80 Del.quantity cm3/ : 17.0...21.0

1000 s: (14.5...23.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

Note remarks

Test sheet : KHD

Edition : 24.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 875 005AA

Injection pump

Pump designation : PES5A950410RS2417

EP type number : 0 410 895 993

Governor

Governor design. : RSV300...1150A8C616L

Governer no. : 0 420 232 323

Customer-spec, information Customer : KHD

Engine : F5L413FR

: 103.0 1st version kW Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 681 343 009

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

A05

Firing order : 1-3-5-4-2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 9.50...9.60

Del.quantity cm3/: 9.3...9.5

100 s: (-)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.2...1.8

100 s: (-) cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm : 1150

Del.quantity : 93.0...95.0

1000 : (-)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 8.50

rpm : 1180...1190 Speed

2nd rack travel in: 4.00

Speed rpm : 1195...1225 3rd rack travel in: 4.00

rpm : 1215...1245 Speed

4th rack travel in: 1380

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 65...73

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.5

Testing:

Speed rpm : 100 Minimum rack trave: 19.50

Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 505...565

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 9.50...9.60

2nd speed rpm : 650

Rack travel in m: 9.70...9.80

3rd speed rpm : 800

Rack travel in m: 9.50...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650 Del.quantity cm3/: 87.5...90.5 1000 s: (-)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.50

rpm : 1180...1190 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 120.0...130.0 1000 s: (-)

Remarks:

Note remarks

Test sheet

: KHD

Edition

: 24.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 400 875 005AB

Injection pump

Pump designation : PES5A95D410RS2417

EP type number : 0 410 895 993

Governor

Governor design. : RSV300...1150A8C616L : 0 420 232 323

Governer no.

Customer

Customer-spec, information : KHD

Engine

: F5L413FR

1st version kW : 98.0

Rated speed

: 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 681 343 009

Opening

pressure, bar

: 172...175

Test Lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

A07

Firing order

: 1-3-5-4-2

Phasing

: 0-72-144-216-288

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BASIC SETTING

1st speed

rpm: 1150

Rack travel in mm : 9.20...9.30

Del.guantity cm3/: 8.8...9.0

100 s: (0-)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.2...1.8

100 s: (-)

Spread

Speed

cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1150

: 88.0...90.0 Del.guantity

1000 : (-)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 8.20

Speed rpm: 1180...1190 2nd rack travel in: 4.00

rpm : 1195...1225 Speed

3rd rack travel in: 4.00

rpm : 1215...1245 Speed

4th rack travel in: 1380

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 65...73

Testina:

Speed rpm : 100 Minimum rack trave: 19.50

Speed rpm : 300 Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00

Speed rpm : 505...565

TORQUE CONTROL

Torque control curve - 1st version 1st speed rpm : 1150

Rack travel in m: 9.20...9.30

2nd speed rpm : 650 Rack travel in m: 9.40...9.50

3rd speed rpm : 800 Rack travel in m: 9.20...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650

Del.quantity cm3/: 82.5...85.5

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.20

Speed rpm : 1180...1190

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (-)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : KHD Edition : 24.07.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 875 005AC Injection pump Pump designation : PES5A95D410RS2417 EP type number : 0 410 895 993 Governor Governor design. : RSV300...1150A8C616L : 0 420 232 323 Governer no. Customer-spec. information Customer : KHD Engine : F5L413FR 1st version kW : 94.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 681 343 009 Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 1.90...2.00 : (1.85...2.05) Rack travel in mm : 9.00...12.00 A09

Firing order : 1-3-5-4-2 Phasing : 0-72-144-216-288 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 8.90...9.00 Del.quantity cm3/: 8.3...8.5 100 s: (-) 2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/ : 1.2...1.8 100 s: (-) Spread cm3 : 0.3100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : ?FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1150 Del.quantity : 83.0...85.0 1000 : (-) RATED SPEED 1st version Control lever position degrees: 100...108 Testing: 1st rack travel in: 7.90 rpm : 1180...1190 Speed 2nd rack travel in: 4.00 rpm : 1195...1225 Speed 3rd rack travel in: 4.00 rpm : 1215...1245 Speed 4th rack travel in: 1380 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever

position degrees: 65...73

Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 rpm : 505...565 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 8.90...9.00 2nd speed rpm : 650 Rack travel in m: 9.10...9.20 3rd speed rpm : 800 Rack travel in m: 8.90...9.10 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/ : 77.5...80.5 1000 s: (-) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 7.90 Speed rpm : 1180...1190 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (-) Remarks:

Note remarks

Test sheet

: KHD Edition : 24.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 400 875 005AD

Injection pump

Pump designation : PES5A95D410RS2417

EP type number : 0 410 895 993

Governor

Governor design. : RSV300...1150A8C616L

Governer no. : 0 420 232 323

Customer—spec. information : KHD

Customer

: F5L413FR Engine

1st version kW : 94.0

Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 1 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00

: (1.85...2.05)

Rack travel in mm: 9.00...12.00

Firing order : 1-3-5-4-2

Phasing

: 0-72-144-216-288

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 1075

Rack travel in mm : 9.10...9.20

Del.quantity cm3/: 8.7...8.9

100 s: (-)

2nd speed rpm : 300.0

Rack travel in mm: 5.9...6.1

Del.quantity cm3/: 1.2...1.8

100 s: (-)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1075

Del.quantity

: 87.0...89.0

1000 : (-)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 8.10

Speed rpm : 1105...1115

2nd rack travel in: 4.00

rpm : 1120...1150 Speed

3rd rack travel in: 4.00

rpm : 1140...1170 Speed

4th rack travel in: 1380

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 65...73

Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 505...565 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1075 Rack travel in m: 9.10...9.20 2nd speed rpm : 650 Rack travel in m: 9.30...9.40 3rd speed rpm : 800 Rack travel in m: 9.10...9.30 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/ : 80.5...83.5 1000 s: (-) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.10 Speed rpm : 1105...1115 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 120.0...130.0 1000 s: (-)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : KHD Edition : 31.07.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 876 198AA Injection pump Pump designation : PES6A95D41ORS2416 EP type number : 0 410 896 961 Governor Governor design. : RSV300...1150A8C616D : 0 420 232 323 Governer no. Customer-spec. information Customer : KHD Engine : F6L413FR 1st version kW : 124.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter

x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 1.90...2.00 : (1.85...2.05) 3rd rack travel in: 4.00

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4Phasina : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 9.50...9.60 Del.quantity cm3/: 9.3...9.5 100 s: (9.1...9.7) cm3 : 0.3Spread 100 s: (0.6) rpm : 300.02nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) Spread cm3 : 0.3 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 5.75 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1150 : 93.0...95.0 Del.quantity 1000 : (91.0...97.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 104...112 Testing: 1st rack travel in: 8.50 rpm : 1180...1190 Speed 2nd rack travel in: 4.00 rpm : 1215...1245 Speed

rpm : 1250...1280 Speed 4th rack travel in: 1410 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring Speed mom : 300 Rack travel in mm: 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00 rpm : 535...595 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 9.50...9.60 2nd speed rpm : 650 Rack travel in m: 9.70...9.80 3rd speed rpm : 800 Rack travel in m: 9.50...9.70 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 650 Speed Del.quantity cm3/: 87.5...90.5 1**000** s: (85.0...93.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.50 rpm : 1180...1190 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 15.80...16.20 Remarks: **APPLICATION** 

A14

Installation 2300

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : KHD Edition : 31.07.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 876 198AB Injection pump Pump designation : PES6A95D410RS2416 EP type number : 0 410 896 961 Governor Governer no. : 0 420 232 323 Customer-spec. information Customer : KHD Engine : F6L413FR 1st version kW : 118.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 609 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses

Governor design. : RSV300...1150A8C616D Set equal delivery quant. per values \_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 1.90...2.00 : (1.85...2.05)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - \* : 0.50 (0.75) BASIC SETTING 1st speed rpm : 1150 Rack travel in mm : 9.20...9.30 Del.quantity cm3/: 8.8...9.0 100 s: (8.6...9.2) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 300.0 Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) Spread cm3 : 0.3 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 5.75 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1150 Del.quantity : 88.0...90.0 1000 : (86.0...92.0) Spread cm3 : 3.50 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 104...112 Testing: 1st rack travel in: 8.20 rpm : 1180...1190 Speed 2nd rack travel in: 4.00 rpm : 1215...1245 Speed 3rd rack travel in: 4.00

rpm : 1250...1280 Speed 4th rack travel in: 1410 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.5 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 Speed rom : 535...595 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 9.20...9.30 2nd speed rpm : 650 Rack travel in m: 9.40...9.50 3rd speed rpm : 800 Rack travel in m: 9.20...9.40 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/: 82.5...85.5 1000 s: (80.0...88.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 8.20 Speed rpm : 1180...1190 STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0)

Speed

Rack travel in mm : 15.80...16.20

Remarks:

**APPLICATION** 

Installation 2300

Note remarks

Test sheet : KHD Edition : 31.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 198AC

Injection pump

Pump designation : PES6A95D41ORS2416 EP type number : 0 410 896 961

Governor

Governor design. : RSV300...1150A8C616D

1

Governer no. : 0 420 232 323

Customer—spec. information Customer : KHD

Engine : F6L413FR

1st version kW : 112.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening |

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ}$  : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 8.90...9.00

Del.quantity cm3/ : 8.3...8.5

100 s: (8.1...8.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 5.9...6.1
Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1150

Del.quantity : 83.0...85.0 1000 : (81.0...87.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 104...112

Testing:

1st rack travel in: 7.90

Speed rpm : 1180...1190

2nd rack travel in: 4.00

Speed rpm : 1210...1240

3rd rack travel in: 4.00

Speed rpm : 1250,...1280 4th rack travel in: 1410 Speed rpm : 0.30...1.40LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring rpm : 300 Rack travel in mm : 5.5 Testina: Speed : 100 L DUI Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed riom : 535...595 TORQUE CONTROL Torque control curve - 1st version rpm : 1150 1st speed Rack travel in m: 8.90...9.00 2nd speed rpm : 650 Rack travel in m: 9.10...9.20 3rd speed rom : 800 Rack travel in m: 8.90...9.10 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/: 77.5...80.5 1000 s: (75.0...83.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 7.90 Speed rpm : 1180...1190 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm: 15.80...16.20 Remarks: **APPLICATION** 

Installation 2300

Note remarks

Test sheet : KHD

Edition : 31.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 198AD

Injection pump

Pump designation : PES6A95D41ORS2416 EP type number : 0 410 896 961

Governor

Governor design. : RSV300...1150A8C616D

Governer no. : 0 420 232 323

Customer-spec, information Customer : KHD

Engine : F6L413FR

: 108.0 1st version kW Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening.

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 8.60...8.70

Del.quantity cm3/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

: 79.0...81.0 Del.quantity 1000 : (77.0...83.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 104...112

Testina:

1st rack travel in: 7.60

rpm : 1180...1190 Speed

2nd rack travel in: 4.00

Speed rpm : 1210...1240 3rd rack travel in: 4.00

rpm : 1245...1275 Speed 4th rack travel in: 1410 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring nom : 300 Rack travel in mm: 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00 rpm : 535...595 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 8.60...8.70 2nd speed rpm : 650 Rack travel in m: 8.80...8.90 3rd speed rpm : 800 Rack travel in m: 8.60...8.80 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/: 72.5...75.5 1000 s: (70.0...78.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 7.60 Speed rpm : 1180...1190 STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 15.80...16.20 Remarks:

APPLICATION

Installation 2300

A20

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : KHD Edition : 31.07.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 876 198AE Injection pump Pump designation : PES6A95D41DRS2416 EP type number : 0 410 896 961 Governor Governor design. : RSV300...1150A8C616D : 0 420 232 323 Governer no. Customer-spec. information Customer : KHD Engine : F6L413FR 1st version kW : 95.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 1.90...2.00 : (1.85...2.05) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4Phasina : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rom: 1150 Rack travel in mm : 8.00...8.10 Del.quantity cm3/: 7.1...7.3 100 s: (6.9...7.5) cm3 : 0.3Spread 100 s: (0.6) rpm : 300.02nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0) Spread cm3 : 0.3100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 5.75FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1150 Del.quantity : 71.0...73.0 1000 : (69.0...75.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control Lever position degrees: 104...112 Testing: 1st rack travel in: 7.00 rpm : 1180...1190 Speed 2nd rack travel in: 4.00 rpm : 1205...1235 Speed

3rd rack travel in: 4.00

Speed rpm : 1240...1270 4th rack travel in: 1410 Speed rpm : 0.30...1.40LOW IDLE 1 Control Lever position degrees: 70...78 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.5 Testina: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00 Speed rpm : 535...595 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 8.00...8.10 2nd speed nom : 650 Rack travel in m: 10.40...10.50 3rd speed rpm : 800 Rack travel in m: 8.00...8.20 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/: 63.5...66.5 1000 s: (61.0...69.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 7.00 Speed rpm : 1180...1190 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm: 15.80...16.20 Remarks:

APPLICATION

Installation 2300

Note remarks

Test sheet : KHD

Edition : 31.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 198AF

Injection pump

Pump designation : PES6A95D41DRS2416

EP type number : 0 410 896 961

Governor

Governor design. : RSV300...1150A8C616D

: 0 420 232 323 Governer no.

Customer-spec. information

Customer : KHD

Engine : F6L413FR

1st version kW : 118.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00

: (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1075

Rack travel in mm : 9.60...9.70

Del.quantity cm3/: 9.3...9.5

100 s: (9.1...9.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0Rack travel in mm: 5.9...6.1

Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.0)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

: 93.0...95.0 Del.quantity 1000 : (91.0...97.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 54...62

Testing:

1st rack travel in: 8.60

Speed rpm : 1115...1125 2nd rack travel in: 4.00

Speed rpm : 1140...1170

3rd rack travel in: 4.00

rpm : 1220...1250 Speed 4th rack travel in: 1410

Speed rom : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 20...28 Setting point w/out bumper spring

rpm : 300 Speed Rack travel in mm: 5.5

Testing:

rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm: 2.00

rpm : 535...595 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1075

Rack travel in m: 9.60...9.70

2nd speed rpm : 650

Rack travel in m: 9.80...9.90

3rd speed rpm : 800

Rack travel in m: 9.60...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 650 Speed

Del.quantity cm3/: 88.5...91.5 1000 s: (86.0...94.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.60

rpm : 1115...1125 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm: 15.80...16.20

Remarks:

**APPLICATION** 

Installation 2300

Note remarks

Test sheet : KHD

Edition : 31.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 199AA

Injection pump

Pump designation : PES6A95D41ORS2416 EP type number : 0 410 896 961

Governor

Governor design. : RSV300...750A7C616L

: 0 420 232 322 Governer no.

Customer-spec. information

Customer : KHD

Engine : F6L413FR

1st version kW : 100.0 : 1500 Rated speed

TEST BENCH REGUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00 : (1.95...2.05)

Rack travel in mm: 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rom : 1000

Rack travel in mm : 8.50...8.60

Del.quantity cm3/: 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm: 6.4...6.6

Del.quantity cm3/ : 1.2...1.8 100 s: (0.9...2.0)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 77.0...79.0 Del.quantity

1000 : (75.0...81.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 92...100

Testing:

1st rack travel in: 7.50

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rpm : 1060...1090 Speed

4th rack travel in: 930

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.0

Testing:

rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 300 Rack travel in mm : 6.40...6.60

Rack travel in mm: 2.00

Speed rpm : 470...530

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 8.50...8.60

2nd speed rpm : 650

Rack travel in m: 8.90...9.00

3rd speed rpm : 800

Rack travel in m: 8.70...8.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650

Del.quantity cm3/: 75.5...78.5 1000 s: (73.0...81.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 7.50

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0)

Remarks:

Note remarks

Test sheet : KHD 1 o 1 : 31.07.92 Edition : 02.90 Replaces Test oil : ISO-4113

Combination no. : 0 400 876 344

Injection pump

Pump designation: PES6A95D410RS2625 : D 410 896 926 EP type number

Governor

Governor design. : RSV325...1250A2C1159

: 0 420 232 490 Governer no.

Customer-spec. information Customer

Engine : BF6L913C

: 130.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet t∈mo. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina .

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 1.90...2.00 Prestroke mm

: (1.85...2.05)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 9.3...9.5

100 s: (9.1...9.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.8)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed Aneroid pressure h: 900

: 93.0...95.0 1000 : (91.0...97.0) Del.quantity

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 92...100

Testing:

1st rack travel in: 10.60

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

Speed rpm : 1320...1350 3rd rack travel in: 4.00 rpm : 1370...1400 Speed

4th rack travel in: 1540

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 63...71

Setting point w/out bumper spring

: 350 rpm Rack travel in mm: 6.0

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 rpm : 350

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 575...635

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 11.60...11.70

2nd speed rpm : 500

Rack travel in m: 12.00...12.10

4th speed rpm : 985

Rack travel in m: 11.70...11.90

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed COM hPa : 900 Pressure

Rack travel mm : 12.00...12.10

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.40...10.50

2nd pressure hPa : 550

Rack travel in m: 10.70...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm : 850

Del.quantity cm3/: 94.5...97.5 1000 s: (92.0...100.0)

Speed rom : 1150

Del.quantity cm3/: 92.0...95.0 1000 s: (89.5...97.5)

Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 54.0...56.0 1000 s: (52.0...58.0)

RACK STOP ADJUSTMENT

rpm : 500 Speed

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.60

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rom : 100

Del.quantity cm3/: 120.0...130.0

1000 s: (117.0...133.0) Rack travel in mm: 17.10...17.30

Remarks:

**APPLICATION** 

Combine-harvester

A28

Note remarks

Test sheet : DEE Edition : 21.65.92 Replaces : 03.92 Test oil : ISO-4113

Combination no. : 0 400 876 381

Injection pump

Pump designation: PES6A100D410RS2762-1

: 0 410 806 008 EP type number

Governor

Governor design. : RSV425...1050A0C2252

-1L

: 0 420 232 571 Governer no.

Customer-spec. information Customer : JOHN DEERE

: 6076TRW-30 Engine

1st version kW : 131.5 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.95...3.05 : (2.90...3.10) Prestroke mm

Rack travel in mm : 10.50

: 1-5- 3- 6- 2- 4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 10.9...11.1

100 s: (10.7...11.3)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 425.0 2nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 2.1...2.5

100 s: (1.9...2.7)

Spread cm3 : 0.6100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 109.0...111.0 Del.quantity

1000 : (107.0...113.0)

: 4.00 Spread cm3 1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 42...50

Testing:

B01

1st rack travel in: 10.30

Speed rpm : 1095...1105

2nd rack travel in: 4.00

rpm : 1165...1175 Speed

3rd rack travel in: 4.00

rpm : 1155...1185 Speed

4th rack travel in: 1300

Speed rom : 0.30...1.40

LOW IDLE 1

Control Lever

position degrees: 20...28 Setting point w/out bumper spring

rpm : 425 Rack travel in mm: 5.1

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 : 425 rpm

Rack travel in mm : 5.50...5.70

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 11.30...11.40

2nd speed rpm : 750

Rack travel in m: 13.10...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750

Del.quantity cm3/: 134.5...138.5 1000 s: (132.5...140.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.30

Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0

1000 s: (95.0...125.0)

LOW IDLE

rpm : 425 Speed

Rack travel in mm: 5.50...5.70 Del.quantity cm3/: 21.5...25.5

1000 s: (19.5...27.5)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE41833

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

**APPLICATION** 

Tractor (tractor engines)

Note remarks

Test sheet : DEE 7,6 w 6
Edition : 21.05.92
Replaces : 03.92
Test oil : ISO-4113

Combination no. : 0 400 876 394

Injection pump

Pump designation : PES6A100D410RS2754 EP type number : 0 410 806 002

Governor

Governor design. : RSV425...1100A0C2234

-2L

Governer no. : 0 420 232 569

Customer-spec. information
Customer : JOHN DEERE

Engine : 6076TRW04

1st version kW : 122.8 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Tast nozzle holder

assembly : 1 688 901 101

Opening .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.95...3.05 : (2.90...3.10)

Rack travel in mm: 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.60...10.70

Del.quantity cm3/: 10.0...10.2

100 s: (9.8...10.4)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0
Rack travel in mm : 5.5...5.7
Del.quantity cm3/: 2.6...3.0

100 s: (2.4...3.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: −3 peed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1100

Del.quantity : 100.5...102.5

1000 : (98.5...104.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

B03

1st rack travel in: 9.60

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1200...1210 Speed

3rd rack travel in: 4.00

rpm : 1190...1220 Speed

4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 17...25

Setting point w/out bumper spring

rpm : 425 Rack travel in mm: 5.1

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rom : 425

Rack travel in mm : 5.50...5.70

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.60...10.70 2nd speed rpm : 700

Rack travel in m: 11.80...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/: 125.0...128.0 1000 s: (122.5...130.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.60

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 100.0...120.0

1000 s: (95.0...125.0)

LOW IDLE

Speed rpm : 425

Rack travel in mm : 5.50...5.70

Del.quantity cm3/: 26.0...30.0

1000 s: (24.0...32.0)

Spread

cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE51026

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

Note remarks

Test sheet

: DEE

Edition

: 24.07.92

Replaces Test oil : 03.92 : ISO-4113

Combination no. : 0 400 876 395

Injection pump

Pump designation : PES6A1000410RS2676

EP type number

: 9 410 230 023

Governor

Governor design. : RSV425...1100A2C2161

-1L

Governer no.

: 9 420 234 133

Customer

Customer-spec. information : JOHN DEERE

Engine

: 6466T

1st version kW : 120.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 32...34

Prestroke mm

: 2.45...2.55

: (2.40...2.60)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 9.40...9.50

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

Spread

cm3 : 0.4

100 s: (0.6)

2nd speed

rpm : 425.0

Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 2.0...2.4

100 s: (1.8...2.7)

Spread

cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

rpm : 1100

Aneroid pressure h: 700

Del.quantity : 98.5...102.5)

cm3

: 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 49...57

B05

Testing: 1st rack travel in: 8.40 rpm : 1145...1155 Speed 2nd rack travel in: 4.00 rpm : 1205...1215 Speed 3rd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1300 r:om : 0.30...1.40 Speed LOW IDLE 1 Control Lever position degrees: 26...34 Setting point w/out bumper spring Speed rpm : 425 Rack travel in mm : 4.9 Testina: Speed rpm : 100 Minimum rack trave: 19.00 rom : 425 Rack travel in mm : 5.30...5.50 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 9.40...9.40 2nd speed rpm : 750 Rack travel in m: 10.70...10.90 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 700 Speed mon Pressure Rack travel mm : 10.60...10.80 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 9.20...9.40 2nd pressure hPa : 80 Rack travel in m: 9.40...9.80 3rd pressure hPa : 175 Rack travel in m: 10.30...10.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700

rpm : 750

Del.quantity cm3/: 116.0...119.0 1000 s: (114.0...121.0)

rpm : 500

Aneroid pressure h: -

Del.quantity cm3/: 86.0...90.0 1000 s: (84.0...92.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 8.40 rom : 1145...1155 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 190.0...210.0 1000 s: (185.0...215.0) LOW IDLE Speed rpm : 425 Rack travel in mm : 5.30...5.50 Del.quantity cm3/ : 20.5...24.5 1000 s: (18.0...27.0) cm3 : 6.00 Spread 1000 s: (8.00) Remarks:

: JOHN DEERE # RE23746

**B06** 

Speed

Speed

Note remarks

Test sheet

: DEE

Edition

: 24.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 400 876 399

Injection pump

Pump designation : PES6A100D410RS2754

EP type number

: 0 410 806 002

Governor

Governor design. : RSV425...1103ABC2234

-3L

Governer no.

: 0 420 232 577

Customer-spec. information Customer

: JOHN DEERE

Engine

: 6076TRW01

1st version kW

: 106.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 101

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,6

Test Lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm

Firing order

: 2.95...3.05

: (2.90...3.10)

Rack travel in mm : 9.00...12.00

: 1-- 5- 3- 6- 2- 4

Phasina

: 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 9.70...9.80

Del.quantity cm3/: 8.9...9.1

100 s: (8.7...9.3)

Spread

cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 2.6...3.0

100 s: (2.3...3.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1100

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

: 4.00

Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:

1st rack travel in: 8.70

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1200...1210 Speed

3rd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1350

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 20...28 Setting point w/out bumper spring

rpm : 425 Rack travel in mm: 5.3

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 : 425 man

Rack travel in mm : 5.70, ... 5.90

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 9.70...9.80

2nd speed rpm : 700

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/: 110.5...114.5

1000 s: (108.5...116.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.70

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 100.0...120.0

1000 s: (95.0...125.0)

LOW IDLE

Speed rpm : 425

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 26.0...30.0

1000 s: (23.5...32.5)

cm3 : 6.00Spread

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE51910

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in

full-load delivery with torque-control

spring retainer.

**APPLICATION** 

Tractor (tractor engines)

Note remarks

Test sheet Edition

: DEE

: 24,07,92

Replaces

Test oil

: ISO-4113

Combination no. : 0 400 876 400

Injection pump

Pump designation : PES6A1000410RS2762-1

EP type number : 0 410 806 008

Governor

Governor design. : RSV425...110CACc2225

-6L

Governer no.

: 0 420 232 578

Customer-spec. information Customer : JOHN DEERE

Engine

: 6076ARW-09

1st version kW : 145.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 101

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,6

Test lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.95...3.05 : (2.90...3.10) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm: 11.90...12.00

Del.quantity cm3/: 11.4...11.6

100 s: (11.2...11.8)

Spread

Spread

cm3 : 0.4

100 s: (0.6)

rpm : 425.0 2nd speed

Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 2.6...3.0

100 s: (2.3...3.2)

cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1100

Aneroid pressure h: 900

Del.quantity : (14.0...118.0)

Spread

cm3 : 4.00 1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testina: 1st rack travel in: 10.90 rpm : 1145...1155 Speed 2nd rack travel in: 4.00 Speed : 1205...1215 I'DNI 3rd rack travel in: 4.00 rom : 1195...1225 Speed 4th rack travel in: 1300 Speed rom : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 20...28 Setting point w/out bumper spring rpm : 425 Speed Rack travel in mm: 5.4 Testing: Speed : 100 rpm Minimum rack trave: 19.00 Speed rpm : 425 Rack travel in mm : 5.80...6.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rom : 1100 Rack travel in m: 11.90...12.00 2nd speed rpm : 750 Rack travel in m: 13.90...14.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom Pressure hPa : 900 Rack travel mm : 13.90...14.10 Measurement Speed 1/min : 5001st pressure hPa : -Rack travel in m: 11.80...12.00 2nd pressure hPa : 500 Rack travel in m: 12.40...12.50

3rd pressure hPa : 665

Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

Del.quantity cm3/: 129.0...133.0 1000 s: (127.0...135.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.90 Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

Speed rpm : 425 Rack travel in mm : 5.80...6.00 Del.quantity cm3/ : 26.0...30.0 1000 s: (23.5...32.5)

Spread cm3 : 5.00 1000 s: (8.00)

Remarks:

: JOHN DEERE # RE51911

Start-of-delivery mark = 13,5° after start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

**APPLICATION** 

Tractor (tractor engines)

B10

Note remarks

Test sheet : DEE

: 24.07.92 Edition

Replaces

Test oil : ISO-4113

Combination no. **:** 0 4**0**0 876 401

Injection pump

Pump designation : PES6A1000410RS2762

EP type number

: 0 410 806 003

Governor

Governor design. : RSV400...1100A0C2204

**-9**L

Governer no. : 0 420 232 579

Customer spec. information

Customer : JOHN DEERE

: 6076TT Engine

1st version kW : 124.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.95...3.05 Prestroke mm : (2.90...3.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.20...11.30

Deciguantity cm3/: 10.4...10.6

100 s: (10.2...10.8)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0 Rack travel in mm: 6.1...6.3 Del.quantity cm3/: 3.1...3.5

100 s: (2.8...3.7)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

: 104.0...106.0 Del.quantity

1000 : (102.0...108.0) Spread : 4.00 cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 10.20

rpm : 1145...1155 Speed

2nd rack travel in: 4.00

rpm : 1205...1215 Speed

3rd rack travel in: 4.00

: 1195...1225 Speed man

4th rack travel in: 1350

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 21...29

Setting point w/out bumper spring

: 400 rpm Rack travel in mm: 5.7

Testina:

Speed rpm : 100 Minimum rack trave: 19.00

rpm : 400 Speed Rack travel in mm : 6.10...6.30

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.20...11.30

rom : 700 2nd speed

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm3/: 127.5...131.5

1000 s: (125.5...133.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 6.10...6.30

Del.quantity cm3/: 31.0...35.0 1000 s: (28.5...37.5)

Spread

cm3 : 6.001000 s: (8.00)

Remarks:

: JOHN DEERE # RE51912

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in

full-load delivery with torque-control

spring retainer.

APPLICATION

Wheel loader

Note remarks

Test sheet

: VAL

Edition

: 24.07.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 400 876 402

Injection pump

Pump designation: PES6A95D32ORS2832

EP type number

: 0 410 896 897

Governor

Governor design.

: RSV500...1100A0C2218

-1R

Governer no.

: 0 420 233 294

Customer-spec. information Customer

: VALMET

Engine

: 620DS MK II

1st version kW

: 131.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

**Opening** 

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values

Set equal delivery quant.

Insp. values in parentheses

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.50...2.60

: (2.45...2.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00 Difference \* CS : 4.50...5.50

BASIC SETTING

1st speed rom : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 10.6...10.8

100 s: (10.4...11.0)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 500.0 2nd speed

Rack travel in mm: 4.7...4.9

Del.quantity cm3/: 1.8...2.4

100 s: (1.5...2.6)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed

rpm : 1100

Del.quantity

: 106.0...108.0

1000 : (104.0...110.0)

: 3.50 cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 11.00

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1200...1230 4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 66...74

Setting point w/out bumper spring

rpni : 500 Rack travel in mm : 4.8

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 Speed : 500 rpm

Rack travel in mm : 4.70...4.90

Rack travel in mm : 2.00

Speed rpm : 510...570

SET IDLE AUXILIARY SPRING Rack travel in mm : 3.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.00...12.10 2nd speed rpm : 700 Rack travel in m: 13.40...13.60

3rd speed rpm : 950

Rack travel in m: 12.40...12.60

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa : 800

Rack travel mm : 13.40...13.60

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 11.70...11.80

2nd pressure hPa : 650

Rack travel in m: 12.80...12.90

3rd pressure hPa : 525

Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed : 700 rpm

Del.quantity cm3/: 115.0...118.0 1000 s: (112.5...120.5)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 84.5...87.5

1000 s: (82.5...89.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 195.0...205.0

1000 s: (192.0...208.0)

Rack travel in man : 19.50...21.00

LOW IDLE

rpm : 500 Speed

Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 18.0...24.0 1000 s: (15.5...26.5)

cm3 : 3.50 Spread

1000 s: (5.50)

:

Remarks:

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : KHD Edition : 03.07.92 Replaces

Test oil : ISO-4113

Combination no. : 0 400 876 403

Injection pump

Pump designation: PES6A95D410RS2471 EP type number : 0 410 896 952

Governor

Governor design. : RSV325...1250A2C661-

ZL

: 0 420 232 581 Governer no.

Customer—spec. information Customen : KHD

Engine : BF6L913C

1st version kW : 132.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00 : (1.85...2.05)

Spread

: 1 419 992 198

RATED SPEED

Spread

1st version Control lever

position degrees: 96...104

Testing:

1st rack travel in: 10.70 rpm : 1290...1300 Speed

2nd rack travel in: 4.00

rpm : 1340...1370 Speed 3rd rack travel in: 4.00

**B15** 

: 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Rack travel in mm : 9.00...12.00

BASIC SETTING

Firing order

1st speed rpm: 1250

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/: 0.9...1.5

100 s: (0.6...1.7)

cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

Del.quantity : 96.0...98.0 1000 : (94.0...100.0)

: 3.50 cm3

1000 : (6.00)

rpm : 1405...1435 Speed 4th rack travel in: 1525

Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 67...75

Setting point w/out bumper spring

rpm : 325 Speed Rack travel in mm: 6.8 Speed rpm : 325
Rack travel in mm : 7.20...7.40

Rack travel in mm: 2.00

Speed rpm : 610...670

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rank travel in m: 11.70...11.80

2nd speed rpm : 500

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 850 Del.quantity cm3/ : 91.5...94.5 1000 s: (89.0...97.0)

**BREAKAWAY** 

1st version 1mm rack travel less 電影時

fuli load rack tr: 他. 他.

Speed rpm : 1290 .... 1300

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0 1000 s: (117.0...133.0)

Rack travel in mm : 15.50...15.90

Remarks:

APPLICATION

Compressor

Note remarks

Test sheet : STE

: 21.05.92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 401 838 706

Injection pump

Pump designation : PE8P110A120LS3252

EP type number : 0 411 818 721

Governor

Governor design. : RQV250...1100PA951-1

Governer no. : 0 421 813 858

Customer-spec. information Customer : SNF

Engine : WD815.69

1st version kW : 250.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 5- 4- 8- 6- 3-7- 2 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 15.3...15.5

100 s: (15.0...15.8)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 300.0 Rack travel in mm : 3.9...4.1 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.30 2nd speed rpm : 450

travel mm : 2.80...3.40

3rd speed rpm : 700

: 4.50...5.10 travel mm

4th speed rpm : 1145

travel mm : 8.40...8.60

5th speed rpm : 1230

: 10.10...10.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1140 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 800

Del.quantity : 153.0...155.0 1000 : (150.0...158.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control Lever

position degrees: ?

Testing:

1st rack travel in: 11.30

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1210...1240 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: ?

Testing:

Speed rpm : 100 Minimum rack trave: 5.00 Speed rpm : 300 Rack travel in mm : 3.90...4.10

CONSTANT REGULATION

rpm : 250...390 Speed

TORQUE CONTROL

Dimension a mm : 1.00

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.20...12.30 2nd speed rpm : 650

Rack travel in m: 13.20...13.30

Aneroid/Altitude Compensator Test

1st version

Setting Speed

: 500 rpm Pressure hPa : 800

Rack travel mm : 13.20...13.30

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 440

Rack travel in m: 11.90...12.00

3rd pressure hPa : 260

Rack travel in m: 9.90...10.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800

Speed rpm : 650 Del.quantity cm3/: 176.0...180.0 1000 s: (173.0...183.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 98.0...100.0

1000 s: (95.0...103.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 220.0...260.0 1000 s: (216.0...264.0)

Rack travel in num : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

•

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : STE Edition : 21.05.92 Replaces Test oil : ISO-4113 Combination no. : 0 401 838 708 Injection pump Pump designation : PE8P110A120LS3252 EP type number : 0 411 818 721 Governor Governor design. : RQ300/1100PA958-1 : 0 421 801 523 Governer no. Customer-spec, information Customer : SNF : WD815.69 Engine 1st version kW : 250.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test lines : 1 680 750 089 Outside diameter x Wall thickness : 8.00x2.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.80...2.90

Rack travel in mm : 9.00...12.00

: (2.75...2.95)

: 1- 5- 4- 8- 6- 3-7- 2 Firing order Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 1100Rack travel in mm : 12.20...12.30 Del.quantity cm3/: 15.3...15.5 100 s: (15.0...15.8) cm3 : 0.4Spread 100 s: (0.7) rpm : 300.02nd speed Rack travel in mm: 3.9...4.1 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) cm3 : 0.4Spread 190 s: (0.7) GUIDE SLEEVE POSITION Control-Lever position Degree: -1 rpm : 600 Speed Rack travel in mm: 15.60...16.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 800 : 153.0...155.0 Del.quantity 1000 : (150.0...158.0) Spread cm3 : 4.001000 : (7.50) RATED SPEED 1st version Setting point: rpm : 600 Rack travel in mm : 16.0 Testing: 1st rack travel in: 11.20 Speed rpm : 1145...1160

and rack travel in: 4.00

Prestroke mm

rpm : 1200...1230 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 4.0

Testina:

Speed mom : 100 Minimum rack trave: 5.20

Speed rpm : 300 Rack travel in mm : 3.90...4.10

Rack travel in mm : 2.00

Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.20...12.30

2nd speed rpm : 650

Rack travel in m: 13.20...13.30

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 man Pressure hPa : 800

: 13.20...13.30 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 440

Rack travel in m: 11.90...12.00

3rd pressure hPa : 260

Rack travel in m: 9.90...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 rpm : 650 Speed

Del.quantity cm3/: 176.0...180.0

1000 s: (173.0...183.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 98.0...100.0 1000 s: (95.0...103.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 220.0...260.0

1000 s: (216.0...264.0)

Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

## Note remarks

Test sheet : DAO 20,9 a Edition : 26.06.92 Replaces : 12.91 Test oil : ISO-4113

Injection pump

Combination no.

Pump designation : PE12P120A520/4LS859

EP type number : 0 411 820 037

Governor

Governor design. : RQ900PA663-9 Governer no. : 0 421 801 577

Customer-spec. information Customer : DAEWOO

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

: 0 401 840 110

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10

: (2.95...3.15)

Rack travel in mm : 9.00,..12.00

: 12- 1- 5- 9- 8- 3-Firing order

4-11-10-2-6-7

Pnasing : 0-45-60-105-120-165-

180-225-240-285-300-

345

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 16.9...17.1

100 s: (16.6...17.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.1...4.5 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8Spread 100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

: 169.0...171.0 1000 : (166.0...174.0) Del.quantity

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 9.00

Speed rpm : 900...905

2nd rack travel in: 4.00

rpm: 932...946 Speed

4th rack travel in: 1000

rpm : 0.00...1.00Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.00

Speed rom : 900...905 Remarks:

: 2-7482

APPLICATION

Generator set

Note remarks

Test sheet

: DAF

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 846 569

Injection pump

Pump designation : PE6P12DA32DRS415-1

EP type number

: 0 411 826 123

Governor

Governor design.

: RQ250/1100PA417R

Governer no.

: 0 421 801 084

Customer

Customer-spec. information : DAF

Engine

: KT 200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm

: 0.8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

B23

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 850

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.5)

Spread

2nd speed

cm3 : 0.5

100 s: (0.9)

rpm : 250.0

Rack travel in mm: 6.7...6.9

Dei.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed

rpm : 700 Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Del.quantity

rpm : 850

Aneroid pressure h: 700

: 160.0...162.0

1000 : (157.0...165.0)

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Speed

Speed

Speed

Setting point:

: 700 rpm

Rack travel in mm: 16.0

Testing:

1st rack travel in: 9.30

rpm : 1125...1140

2nd rack travel in: 4.00

rpm : 1175...1205

4th rack travel in: 1300

rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 6.2

Testing:

rpm : 150 Speed Minimum rack trave: 7.00

Speed rpm : 250
Rack travel in mm : 6.10...6.30

Rack travel in mm : 2.00 rom : 450 ... 490 Speed

TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 11.30...11.40

2nd speed rpm : 1080

Rack travel in m: 11.20...11.40

Aneroid/Altitude Compensator Test

1st version

Settina

: 600 Speed rom hPa : 700 Pressure

Rack travel mm : 10.30...10.40

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 180

Rack travel in m: 10.10...10.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 132.5...134.5

1000 s: (129.5...137.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30

rpm : 1125...1140 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 305.0...345.0 1000 s: (305.0...345.0)

Rack travel in mm: 19.50...21.00

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 6.10...6.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS : 1-5-3-6-2-4 Firing order Note remarks Test sheet : VOL 10,0q19 Phasing : 0-60-120-180-240-300 : 24.07.92 Edition : 03.91 Replaces Tolerance + - ° : 0.50 (0.75) Test oil : ISO-4113 Time to cyl. no. Combination no. : 0 401 846 759 BASIC SETTING Injection pump Pump designation : PE6P110A320RS3108Y rpm: 700 1st speed EP type number : D 411 816 729 Governor Rack travel in mm : 11.10...11.20 Governor design. : RQV250...1100PA920-1 : 0 421 815 778 Governer no. Del.quantity cm3/: 13.8...14.0 Customer-spec. information 100 s: (13.5...14.3) Customer : VOLVO Spread cm3 : 0.4Engine : THD100EC 100 s: (0.7) 1st version kW : 180.0 Rated speed : 2200 rpm : 250.0 2nd speed Rack travel in mm : 5.2...5.4 Del.quantity cm3/ : 3.0...3.4 TEST BENCH REQUIREMENTS 100 s: (2.7...3.6) Test oil Spread cm3 : 0.3inlet temp. °C : 38...42 100 s: (0.6) Overflow valve (B) Setting of injection pump : 1 417 413 025 with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL 1st speed rpm : 250 Test nozzle holder travel mm : 1.10...1.30 assembly : 0 681 343 009 2nd speed rpm : 500 : 4.10...4.90 travel mm Opening 3rd speed rpm : 700 : 6.30...6.70 rpm : 950 pressure, bar : 172...175 travel mm 4th speed : 6.30...6.70 travel mm Test lines : 1 680 750 015 5th speed rpm : 1100 travel mm : 7.00...7.50 Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00x1.50x600 x Length mm Control-lever position Degree: -1 rpm : 1175 (A) Injection pump setting values Speed Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. per values \_ FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 700 Aneroid pressure h: 900

Del.quantity

: 138.0...140.0

1000 : (135.0...143.0)

Prestroke mm

: 3.00...3.10

Rack travel in mm : 9.00...12.00

: (2.95...3.15)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 61...69

Testina:

1st rack travel in: 10.10

Speed rpm : 1160...1170 2nd rack travel in: 4.00

rpm : 1225...1255 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testing:

Speed rom : 100

Minimum rack trave: 6.70 Speed ; 250 rpm

Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

rpm : 250...425 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 man Pressure hPa : 900

Rack travel mm : 11.10...11.20

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.60...9.80

2nd pressure hPa : 280

Rack travel in m: 9.80...9.90

3rd pressure hPa : 430

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700

Del.quantity cm3/: 106.0...108.0

1000 s: (103.0...111.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.10

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 170.0...200.0

1000 s: (166.0...204.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.20...5.40
Del.quantity cm3/ : 30.0...34.0

1000 s: (27.5...36.5)

Spread cm3 : 3.00

1000 s: (6.00)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

APPLICATION

**Omnibus** 

Note remarks

Test sheet : VOL 10,0a20 : 03.07.92 Edition : 03.91 Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 760

Injection pump

Pump designation : PE6P110A320RS3108X

EP type number : 0 411 816 730

Governor

Governor design. : RQV250...1100PA920-2

: 0 421 813 779 Governer no.

Customer-spec. information Customer : VOLVO

Engine : THD100ED

1st version kW : 203.0 : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina .

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10

: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 16.0...16.2

100 s: (15.7...16.5)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 250.02nd speed Rack travel in mm: 5.0...5.2 Del.quantity cm3/: 3.0...3.4

100 s: (2.7...3.6)

cm3 : 0.3Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

: 1.10...1.30 travel mm

rpm : 500 2nd speed

: 4.10...4.90 travel mm

3rd speed rpm : 700

: 6.30...6.70 travel mm

rpm : 950 4th speed

: 6.30...6.70 travel mm

5th speed : 1100 rpm

: 7.00...7.50 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1175 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 160.0...162.0 1000 : (157.0...165.0)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control Lever

position degrees: 61...69

Testing:

1st rack travel in: 11.10

rpm : 1160...1170 Speed

2nd rack travel in: 4.00

Speed rpm : 1225...1255 4th rack travel in: 1350

Speed rom : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 8...16

Testina:

: 100 Speed rpm

Minimum rack trave: 6.70

rpm : 250 Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

Speed rpm : 250...425

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 900 Pressure

: 12.10...12.20 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.40

2nd pressure hPa : 280

Rack travel in m: 9.50...9.60

3rd pressure hPa : 700

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 106.0...108.0

1000 s: (103.0...111.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.10

Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...200.0

1000 s: (166.0...204.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 5.00...5.20

Del.quantity cm3/: 30.0...34.0

1000 s: (27.5...36.5) cm3 : 3.00

Spread

1000 s: (6.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

**APPLICATION** 

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : VOL 12,2 e2 : 24.07.92 Edition : 03.91 Replaces Test oil : ISO-4113 : 0 401 846 852 Combination no. Injection pump Pump designation : PE6P120A320RS3118 EP type number : 0 411 826 726 Governor : RQV250...1050PA921 Governor design. -10: 0 421 813 793 Governer no. Customer-spec. information : VOLVO Customer Engine : TD122FAQ,FGQ : 287.0 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27 CO1

Prestroke mm : 2.60...2.70 : (2.55...2.75) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 13.80...13.90 Del.guantity cm3/: 23.5...23.7 100 s: (23.2...24.0) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 250.0Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5) Spread cm3 : 0.5100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed travel mm : 1.00...1.40 rom : 3502nd speed : 2.20...2.80 travel mm 3rd speed rpm : 700 : 6.40...6.60 travel mm : 1085 4th speed rpm : 8.40...8.60 travel mm : 1160 5th speed rpm : 9.60...10.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1085 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 250.0...240.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 116...124

Testing:

1st rack travel in: 12.80

rpm : 1080...1090 Speed

2nd rack travel in: 4.00

Speed rpm: 1160...1190 4th rack travel in: 1300 Speed

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 59...67

Testing:

Speed : 100 L DU

Minimum rack trave: 5.90

Speed rpm: 250 Rack travel in mm: 4.30...4.50

CONSTANT REGULATION

Speed rom : 250...350

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed mon : 500

Pressure hPa : 1000

Rack travel mm : 13.80...13.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 90

Rack travel in m: 10.20...10.30

3rd pressure hPa : 660

Rack travel in m: 13.30...13.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed

rpm : 700

Del.quantity cm3/: 149.0...151.0

1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 1080...1090 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 240.0...280.0

1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.30...4.50

Del.quantity cm3/: 17.5...22.5

1000 s: (15.0...25.0) cm3 : 5.00

1000 s: (7,00)

Remarks:

Spread

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 12,2 e3 : 24.07.92 Test sheet Edition : 03.91 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 853 Injection pump Pump designation : PE6P120A320RS3118 EP type number : 0 411 826 726 Governor Governor design. : RQV250...900PA921-11 : 0 421 813 794 Governer no. Customer-spec. information Customer : VOLVO Engine : TD122FBQ,FEQ : 287.0 1st version kW : 1800 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 Opening : 207...210 pressure, bar Orifice plate : 0,8 diameter mm Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Insp. values in parentheses Set equal delivery quant.

: 2.60...2.70 Prestroke mm : (2.55...2.75)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - \* ; 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 13.80...13.90 Del.quantity cm3/: 23.5...23.7 100 s: (23.2...24.0) cm3 : 0.5Spread 100 s: (0.9) rpm : 250.02nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5) cm3 : 0.5Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 travel mm : 1.00...1.40 rpm : 350 2nd speed 2.20...2.80 travel mm 3rd speed : 700 rom. 6.40...6.60 travel mm 935 4th speed mqn 7.60...7.80 travel mm 5th speed 1015 rpm : 8.90...9.30 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 980 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed

Aneroid pressure h: 1000

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 113...121

Testing:

1st rack travel in: 12.80 rpm : 930...940 Speed 2nd rack travel in: 4.00 rom : 1010...1040 Speed

4th rack travel in: 1150 rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 59...67

Testing:

Speed : 100 man Minimum rack trave: 5.90 Speed : 250 CDM

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

Speed rom : 250...350

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 mon hPa : 1000 Pressure

: 13.80...13.90 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.20 2nd pressure hPa : 90 Rack travel in m: 10.20...10.30

3rd pressure hPa : 660

Rack travel in m: 13.30...13.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 149.0...151.0

1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.80 rpm : 930...940 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 240.0...280.0

1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm: 250
Rack travel in mm: 4.30...4.50
Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0)

cm3 : 5.00

1000 s: (7.00)

Remarks:

Spread

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

CO4

Note remarks

Test sheet : VOL 12,2 e4
Edition : 24.07.92
Replaces : 03.91

Test oil : ISO-4113

Combination no. : 0 401 846 854

Injection pump

Pump designation : PE6P120A320RS3118-1

EP type number : 0 411 826 739

Governor

Governor design. : RQV250...850PA921-12

Governer no. : 0 421 813 795

Customer—spec. information Customer : VOLVO

Engine : TD122FCQ

1st version kW : 287.0 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70 : (2.55...2.75)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 4.3...4.5 Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm3 : 0.5 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 2.20...2.80

3rd speed rpm : 700

travel mm : 6.40...6.60

4th speed rpm : 885

travel mm : 7.60...7.80

5th speed rpm: 955

travel mm : 8.80...9.20

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 930

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700

Aneroid pressure h: 1000

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 112...120

Testing:

1st rack travel in: 12.00 rpm : 880...890 Speed

2nd rack travel in: 4.00 rpm : 955...985 Speed 4th rack travel in: 1100

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 59...67

Testing:

: 100 Speed rom Minimum rack trave: 5.90 rpm : 250 Speed

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rom hPa : 1000 Pressure

Rack travel mm : 13.00...13.10

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 90

Rack travel in m: 10.20...10.30

3rd pressure hPa : 600

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.00 rpm : 880...890 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 240.0...280.0 1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.30...4.50 Del.quantity cm3/: 17.5...22.5

1000 s: (15.0...25.0)

cm3 : 5.00Spread 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 12,2 e5 : 24.07.92 Test sheet Edition : 12.91 Replaces : ISO-4113 Test oil : 0 401 846 854HD Combination no. Injection pump Pump designation : PE6P120A320RS3118-1 : 0 411 826 739 EP type number Governor Governor design. : RQV250...850PA921-12 : D 421 813 795 Governer no. Customer-spec. information Customer : VOLVO-TRUCK Engine : TD122FCQ : 287.0 1st version kW Rated speed : 1700 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening . pressure, bar : 207...210 Orifice plate diameter mm : 0.8 Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70 : (2.55...2.75) Rack travel in mm : 9.00...12.00 : 1-5- 3- 6- 2- 4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm : 13.00...13.10 Del.quantity cm3/: 21.4...21.6 100 s: (21.1...21.9) Spread cm3 : 0.5100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5) cm3 : 0.5Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.00...1.40 travel mm 2nd speed rpm : 350 : 2.20...2.80 travel mm rpm : 700 3rd speed : 6.40...6.60 travel mm 4th speed rpm : 885 travel mm : 7.60...7.80 : 955 5th speed rpm travel mm : 8.80...9.20 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 930 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

rpm : 700

Aneroid pressure h: 1000

Speed

Del.quantity : 214.0...216.0

1000 : (211.0...219.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 112...120

Testing:

1st rack travel in: 12.00 Speed rpm : 880...890 2nd rack travel in: 4.00 Speed rpm : 955...985

4th rack travel in: 1100 rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 59...67

Testing:

Speed rpm : 100 Minimum rack trave: 5.90 rpm : 250 Speed

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version Setting

rpm : 500 hPa : 1000 Speed rpm Pressure

Rack travel mm : 13.00...13.10

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 90

Rack travel in m: 10.20...10.30

3rd pressure hPa : 600

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 149.0...151.0

1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.00 rpm : 880...890 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 240.0...280.0

1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.30...4.50 Del.quantity cm3/: 17.5...22.5

1000 s: (15.0...25.0)

Spread cm3 : 5.001000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

: 2.60...2.70 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (2.55...2.75) Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 : VOL 12,2 i1 Test sheet : 24.07.92 Edition : 03.91 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 : 0 401 846 869 Tolerance + - ° : 0.50 (0.75) Combination no. Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS3118 EP type number : 0 411 826 726 BASIC SETTING Governor rpm: 700 Governor design. : RQV250...1100PA920-5 1st speed : 0 421 813 782 Governer no. Rack travel in mm : 12.70...12.80 Customer-spec. information : VOLVO Del.quantity cm3/: 22.2...22.4 Customer 100 s: (21.9...22.7) : THD 102 KD Engine : 250.0 cm3 : 0.51st version kW Spread : 2200 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Test oil Rack travel in mm: 4.4...4.6 Del.quantity cm3/: 2.9...3.4 inlet temp. °C : 38...42 100 s: (2.7...3.7) Overflow valve Spread cm3 : 0.5: 1 417 413 025 100 s: (0.7) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 019 GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.10...1.30 **Opening** travel mm : 207...210 : 500 pressure, bar 2nd speed rpm : 4.10...4.90 travel mm Orifice plate : 700 3rd speed rpm diameter mm : 0,8 travel mm : 6.30...6.70 4th speed : 950 rpm : 6.30...6.70 travel mm : 1100 Test lines : 1 680 750 067 5th speed man : 7.00...7.50 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X1.50X1000 Control-lever position x Length mm Degree: -1 (A) Injection pump setting values Speed rpm : 1175 Rack travel in mm : 15.20...17.80 Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version

Speed

rpm : 700

Aneroid pressure h: 1200

Test pressure, bar: 25...27

Del.quantity : 222.0...224.0

1000 : (219.0...227.0)

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 112...120

Testing:

1st rack travel in: 11.70

rpm : 1130...1140 Speed

2nd rack travel in: 4.00

Speed rpm : 1210...1240 4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 63...71

Testing:

: 100 Speed rpm Minimum rack trave: 6.00 rpm : 250 Speed

Rack travel in mm : 4.40...4.60

CONSTANT REGULATION

rpm : 250...420 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm hPa : 1200 Pressure

: 12.70...12.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.40...8.60

2nd pressure hPa : 160

Rack travel in m: 8.60...8.70

3rd pressure hPa : 810

Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm: 700 Del.quantity cm3/: 133.0...135.0 1000 s: (130.0...138.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70

rpm : 1130...1140 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 230.0...270.0

1000 s: (226.0...274.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.40...4.60

Del.quantity cm3/: 29.5...34.5

1000 s: (27.0...37.0)

cm3 : 5.00 Spread

1000 s: (7.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

APPLICATION

**Omnibus** 

Note remarks

Test sheet : VOL 10,0 y7 : 24.07.92 Edition

: 03.91 Replaces Test oil : ISO-4113

: 0 401 846 890 Combination no.

Injection pump

Pump designation : PE6P110A32ORS3080-3

EP type number : 0 411 816 758

Governor

Governor design. : RQV250...950PA921-15

: 0 421 813 798 Governer no.

Customer-spec. information Customer : VOLVO

Engine : TD102FH

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10

: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.60...12.70

Del.guantity cm3/: 17.9...18.1

100 s: (17.6...18.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.02nd speed Rack travel in mm : 3.8...4.0 Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.3100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 : 1.00...1.40 travel mm

: 350 2nd speed man

: 2.20...2.80 travel mm

: 750 3rd speed rpm

travel mm : 6.30...6.70

: 985 4th speed man

: 8.20...8.40 travel mm

5th speed rom : 1060

: 9.10...9.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 985

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 11.60 rpm : 980...990 Speed 2nd rack travel in: 4.00

rpm : 1040...1070 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 59...67

Testina:

Speed : 100 rpm Minimum rack trave: 5.30 rpm : 250 Speed

Rack travel in mm : 3.80...4.00

CONSTANT REGULATION

rpm : 250...360 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom hPa : 900 Pressure

: 12.60...12.70 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.90...10.10
2nd pressure hPa : 140
Rack travel in m: 10.10...10.20
3rd pressure hPa : 500

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.60

rpm : 980...990 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 160.0...190.0

1000 s: (156.0...194.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 3.80...4.00
Del.quantity cm3/ : 15.0...19.0
1000 s: (12.5...21.5)

cm3 : 3.00Spread

1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Note remarks

: MB 11,0 x Test sheet : 21.05.92 Edition : 01.92 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 910

Injection pump

Pump designation : PE6P110A320LS3851 EP type number : 0 411 816 765

Governor

Governor design. : PQ300/1050PA187-26 : 0 421 801 489 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM441

1st version kW : 160.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...4.55) Rack travel in mm : 9.00...12.00

: 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + ~ ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 11.20...11.30

Del.guantity cm3/: 12.2...12.4

100 s: (11.9...12.6)

Spread cm3 : 0.8

100 s: (1.3)

rpm : 300.0 2nd speed

Rack travel in mm: 6.5...7.1 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4) cm3 : 0.6

Spread 100 s: (1.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 650 Speed

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 122.0...124.0 Del.quantity

1000 : (119.5...126.5) : 8.50 cm3 Spread

1000 : (13.00)

RATED SPEED

1st version

Setting point:

Speed mari Rack travel in mm: 13.5 Testina:

1st rack travel in: 10.20

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

Speed rpm : 1175...1205 4th rack travel in: 1300

rpm : 0.00...2.00Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.8

Testing:

rpm : 200 Speed Minimum rack trave: 8.50

Speed rpm : 300 Rack travel in mm : 6.50...7.10

Rack travel in mm : 2.00 Speed rpm : 390...430

FUEL DELIVERY CHARACTERISTICS

1st version

: 600 Speed man

Del.quantity cm3/: 119.0...125.0

1000 s: (116.5...127.5)

cm3 : 11.00 Spread

1000 s: (14.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0)

Remarks:

C14

Note remarks

Test sheet : MB 11,0 w
Edition : 21.05.92
Replaces : 01.92
Test oil : ISO-4113

Combination no. : 0 401 846 918

Injection pump

Pump designation : PE6P110A320LS3851 EP type number : 0 411 816 765

Governor

Governor design. : RQV300...1050PA884-6

Governer no. : 0 421 813 832

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M441

1st version kW : 160.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 101

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50

: (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order

: 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 12.2...12.4

100 s: (11.9...12.6)

Spread cm3 : 0.8

100 s: (1.3)

2nd speed rpm : 300.0
Rack travel in mm : 6.5...7.1
Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm3 : 0.6 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm: 300

travel mm : 0.50...1.00

2nd speed rpm : 460

travel mm : 2.70...3.20

3rd speed rpm : 738

travel mm : 4.60...5.10

4th speed rpm : 1107 travel mm : 7.90...8.40

5th speed rpm: 1370

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm: 1225

Rack travel in mm : 8.90...11.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

: 122.0...124.0 Del.quantity 1000 : (119.5...126.5)

Spread cm3 : 8.50

1000 : (13.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 10.20

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1175...1205 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 83...91

Testing:

rpm : 200 Speed Minimum rack trave: 8.50

rom

Rack travel in mm : 6.50...7.10

CONSTANT REGULATION

: 300...500 Speed rpm

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 600 Speed

Del.quantity cm3/: 119.0...125.0

1000 s: (116.5...127.5)

cm3 : 11.00Spread

1000 s: (14.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

:

1000 s: (126.0...154.0)

Remarks:

C16

Note remarks

Test sheet : VOL 12,2 e : 24.07.92 Edition : 12.89 Replaces

Test oil : ISO-4113

: 0 401 846 919 Combination no.

Injection pump

Pump designation : PE6P120A320RS3118-7

EP type number : 0 411 826 790

Governor

Governor design. : RQV250...950PA921-20

: 0 421 813 838 Governer no.

Customer-spec. information

: VOLVO-TRUCK Customer

: TD122FTQ Engine S

1st version kW : 221.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 D25

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70 : (2.55...2.75)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 19.4...19.6

100 s: (19.1...19.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5)

cm3 : 0.5Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 1.00...1.40

travel mm 350

2nd speed rpm :

2.20...2.80 travel mm

3rd speed : 750 rpm

: 6.30...6.70 travel mm

4th speed : 995 man

: 8.20...8.40 travel mm

: 1060 5th speed rpm : 9.30...9.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 990 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 794.0....99.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testing:

1st rack travel in: 11.20 rpm : 990...1000 Speed 2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1150

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 58...66

Testina:

rpm : 100 Speed Minimum rack trave: 5.90 rpm : 250 Speed

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500 hPa : 1000 Pressure

: 12.20...12.30 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 90

Rack travel in m: 10.20...10.30

3rd pressure hPa : 440

Rack travel in m: 11.70...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 149.0...151.0

1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.20

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 240.0...280.0 1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.30...4.50 Del.quantity cm3/: 17.5...22.5

1000 s: (15.0...25.0)

cm3 : 5.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 12,2 e1 : 24.07.92 Test sheet Edition : 12.89 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 920 Injection pump Pump designation : PE6P12OA32ORS3118-8 EP type number : 0 411 826 791 Governor Governor design. : RQV250...950PA921-21 : 0 421 813 839 Governer no. Customer-spec. information Customer : VOLVO-TRUCK : TD122FKQ Engine : 254.0 1st version kW Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 Openina pressure, bar : 207...210 Orifice plate diameter mm : 0.8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 2.60...2.70 : (2.55...2.75) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm : 7001st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 250.0 2nd speed Rack travel in mm : 4.0...4.2 Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

cm3 : 0.5Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL 1st speed rpm : 250

: 1.00...1.40 travel mm 2nd speed rpm : 350

travel mm : 2.20...2.80 : 750 3rd speed rpm

: 6.30...6.70 travel mm

rpm : 995 4th speed

travel mm : 8.20...8.40

rpm : 10605th speed

: 9.30...9.70 travel mm

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 990 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed Aneroid pressure h: 1200 Del.quantity : 234.0...236.0

1000 : (231.0...239.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 12.60 rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 58...66

Testing:

Speed : 100 rpm Minimum rack trave: 5.60 : 250 Speed rpm

Rack travel in mm : 4.00...4.20

CONSTANT REGULATION

rpm : 250...350 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm hPa : 1200 Pressure

: 13.60...13.70 Rack travel mm

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 9.60...9.80

2nd pressure hPa : 90

Rack travel in m: 9.80...9.90

3rd pressure hPa : 800

Rack travel in m: 13.10...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm: 700 Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.60 rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 240.0...280.0

1000 s: (236.0...284.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.00...4.20 Del.quantity cm3/: 17.5...22.5

1000 s: (15.0...25.0)

cm3 : 5.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 10,2 a Test sheet Edition : 24.07.92 : 07.91 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 935 Injection pump Pump designation : PE6P12OA32ORS3262 : 0 411 826 797 EP type number Governor Governor design. : RQV300...1050PA232-4 : 0 421 813 883 Governer no. Customer-spec. information Customer : VOLVO : TD102 GC Engine : 180.0 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening. : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasina : 0-60-120-180-240-300 : 0.50 (0.75)Tolerance + - ° Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm : 9.40...9.50 Del.quantity cm3/: 17.4...17.6 100 s: (17.1...17.9) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 300.0Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 3.2...3.7 100 s: (2.9...3.9) cm3 : 0.5Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 300 1st speed : 1.30...1.70 travel mm rpm : 500 2nd speed : 2.70...3.30 travel mm rpm : 800 3rd speed : 4.90...5.50 travel mm rpm : 1100 4th speed : 7.60...7.70 travel mm rpm : 1180 5th speed travel mm : 8.80...9.20 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1150 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 108...116

Testing:

1st rack travel in: 8.40

Speed rpm : 1090...1100

2nd rack travel in: 4.00

Speed rpm : 1150...1180 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 80...88

Testing:

rpm : 100 Speed Minimum rack trave: 6.90 rpm : 300 Speed

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 300...410 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rom hPa : 900 Pressure

Rack travel mm : 9.40...9.50

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 170

Rack travel in m: 9.30...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm: 700 Del.quantity cm3/: 171.0...173.0 1000 s: (168.0...176.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 8.40

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 160.0...190.0

1000 s: (156.0...194.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 32.0...37.0

1000 s: (29.5...39.5)

cm3 : 5.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: VOL 5,9 b Test sheet : 24.07.92 Edition : 12.91 Replaces : ISO-4113 Test oil

Combination no. : 0 401 846 937

Injection pump

Pump designation : PE6P11DA32ORS3266 EP type number : 0 411 816 777

Governor

Governor design. : RQV300...1300PA996K

Governer no. : 0 421 815 277

Customer-spec. information

Customer : VOLVO-TRUCK

Engine : TD63ES

1st version kW : 155.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.40...2.50 : (2.30...2.50) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 780

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 13.9...14.1

100 s: (13.7...14.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 330.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 1.7...2.1

100 s: (1.4...2.4)

cm3 : 0.7Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 330

travel mm : 1.20...1.60 2nd speed rpm : 500

: 2.90...3.50 travel mm

: 900 3rd speed rom : 4.70...5.30 travel mm

: 1370

4th speed rpm

: 1450 5th speed man

: 11.00...11.40 travel mm

: 9.80...10.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1470 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

travel mm

Speed rpm : 780 Aneroid pressure h: 1200 Del.quantity : 139.0...141.0

1000 : (137.0...143.0)

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 114...122

Testing:

1st rack travel in: 11.20

rpm : 1360...1370 Speed

2nd rack travel in: 4.00

rpm : 1430...1460 Speed

4th rack travel in: 1520

rpm : 0.00...1.00Speed

LOW TDLE 1 Control lever

position degrees: 70...78

Testing:

: 100 Speed rpm Minimum rack trave: 7.00 Speed : 330 rpm

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 330...600 Speed

TORQUE CONTROL

Dimension a mm: 0.30

Torque control curve - 1st version

rpm : 780 1st speed

Rack travel in m: 11.90...12.00

rpm : 1300 2nd speed

Rack travel in m: 12.20...12.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 1300 rom hPa : 1200 Pressure

Rack travel mm : 12.20...12.40

Measurement

1/min: 1300 Speed

1st pressure hPa : -

Rack travel in m: 8.50...8.70

2nd pressure hPa : 110

Rack travel in m: 8.70...8.80

3rd pressure hPa : 750

Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 1300 Speed rom

Del.quantity cm3/: 130.0...134.0 1000 s: (127.0...137.0)

cm3 : 8.00Spread 1000 s: (12.)

Aneroid pressure h: -

Speed rpm: 780
Del.quantity cm3/: 73.0...75.0
1000 s: (70.0...78.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.20

rpm : 1360...1370 Speed

STARTING FUEL DELIVERY

: 100 Speed rom

Del.quantity cm3/: 65.0...85.0

1000 s: (61.0...89.0)

Rack travel in mm : 8.50...8.70

LOW IDLE

Speed rpm : 330 Rack travel in mm : 5.40...5.60 Del.quantity cm3/ : 17.0...21.0 1000 s: (14.0...24.0)

cm3 : 7.00Spread

1000 s: (11.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

Note remarks

: VOL 5,9 b 1 Test sheet : 24.07.92 Edition : 02.92 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 938

Injection pump

Pump designation : PE6P110A320RS3266 EP type number : 0 412 816 777

Governor

Governor design. : RQV300...1300PA996-1

: 0 421 815 278 Governer no.

Customer-spec, information

Customer : VOLVO-TRUCK

Engine : TD63E

1st version kW : 133.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.40...2.50 : (2.30...2.50)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4

Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 780

Rack travel in mm : 10.30...10.40

Del.guantity cm3/: 10.2...10.4

100 s: (10.0...10.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 330.02nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 1.7...2.1

100 s: (1.4...2.4)

cm3 : 0.7Spread

100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 330 1st speed

: 1.20...1.60 travel mm

rpm : 500 2nd speed

: 2.90...3.50 travel mm

3rd speed rpm : 900

: 4.70...5.30 travel mm

rpm : 1370 4th speed

: 9.80...10.00 travel mm

rpm : 14505th speed

: 11.00...11.40 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1470

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 780

Aneroid pressure h: 1200 3rd pressure hPa : 650 Del.quantity : 702.0...106.0) Rack travel in m: 10.80...11.00 : 5.00 cm3 FUEL DELIVERY CHARACTERISTICS Spread 1000 : (9.00) RATED SPEED 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/: 114.0...118.0 1st version Control lever 1000 s: (111.0...121.0) position degrees: 114...122 Spread cm3 : 8.00 1000 s: (12.0) Testina: 1st rack travel in: 10.20 Aneroid pressure h: 1200 : 1300 rpm : 1360...1370 Speed Speed rpm Del.quantity cm3/: 118.0...124.0 2nd rack travel in: 4.00 Speed rpm : 1420...1450 4th rack travel in: 1520 1000 s: (115.0...127.0) Aneroid pressure h: -Speed rpm : 780 Del.quantity cm3/ : 73.0...75.0 Speed rpm : 0.00...1.00LOW IDLE 1 1000 s: (70.0...78.0) Control lever position degrees: 70...78 **BREAKAWAY** Testing: : 100 Speed rpm 1st version Minimum rack trave: 7.00 1mm rack travel less than Speed rpm : 330 Rack travel in mm : 5.40...5.60 full load rack tr: 10.20 rpm : 1360...1370 Speed CONSTANT REGULATION STARTING FUEL DELIVERY Speed rpm : 330...600 TORQUE CONTROL Dimension a mm : 0.90 rpm : 100 Del.quantity cm3/: 65.0...85.0 Torque control curve - 1st version 1st speed rpm : 780 1000 s: (61.0...89.0) Rack travel in m: 10.30...10.40 and speed rpm : 1050 Rack travel in m: 10.80...11.00 Rack travel in mm : 8.50...8.70 2nd speed LOW IDLE rpm : 1300 3rd speed Rack travel in m: 11.20...11.40 Speed rpm : 330 Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 17.0...21.0 Aneroid/Altitude 1000 s: (14.0...24.0) Compensator Test cm3 : 7.00Spread 1000 s: (11.00) 1st version Setting Remarks: Speed rpm : 1300 hPa : 1200 Pressure Delivery-valve spring pre-tension = 2.40...2.60 mm. : 11.20...11.40 Rack travel mm Measurement Permissible alteration from 2.20...2.90 Speed  $1/\min : 1300$ 1st pressure hPa : -Start-of-delivery setting with ROBO Rack travel in m: 8.50...8.70 diaphragm. 2nd pressure hPa : 140 Rack travel in m: 8.70...8.80

: 2.80...2.90 : (2.75...2.95) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 : VOL 12,2 L Test sheet : 21.05.92 Edition : 11.91 Replaces : ISO-4113 : 0-60-120-180-240-300 Test oil Phasing Tolerance + - ° : 0 401 846 951 : 0.50 (0.75)Combination no. Time to cyl. no. : 1 Injection pump Pump designation : PE6P120A320RS3240 : 0 411 826 786 BASIC SETTING EP type number Governor Governor design. : RQV250...1175PA371-2 rpm : 7001st speed Governer no. : 0 421 813 945 Rack travel in mm : 13.30...13.40 Customer-spec, information Del.quantity cm3/: 24.0...24.2 Customer : VOLVO-TRUCK : TD122FS 100 s: (23.7...24.5) Engine 1st version kW : 309.0 Spread cm3 : 0.5Rated speed : 2350 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0 Rack travel in mm: 4.9...5.1 Test oil Del.quantity cm3/: 2.7...3.2 inlet temp. °C : 38...42 100 s: (2.5...3.5) Overflow valve Spread cm3 : 0.5: 1 457 413 010 100 s: (0.7) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 019 GUIDT SLEEVE TRAVEL assembly rpm : 250 1st speed : 1.00...1.40 Opening travel mm : 207...210 rpm : 450 pressure, bar 2nd speed : 2.40...3.00 travel mm Orifice plate 3rd speed : 800 rpm : 4.40...5.00 diameter mm : 0,3 travel mm : 1240 4th speed man : 8.50...8.70 travel mm rpm : 1350 Test lines : 1 680 750 067 5th speed : 9.80...10.20 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00x1.50x1000 x Length mm Control-lever position Degree: -1 (A) Injection pump setting values Speed rpm : 1240 Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 rpm : 700 Speed

Aneroid pressure h: 1200

: 240.0...242.0 Del.quantity

1000 : (237.0...245.0)

: 5.00 Spread cm31000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 12.30

rpm : 1230...1240 Speed

2nd rack travel in: 4.00

rpm : 1320...1350 Speed

4th rack travel in: 1420

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 68...76

Testing:

: 100 Speed man

Minimum rack trave: 6.50 rpm : 250 Speed

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 250...340 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1200 Pressure

Rack travel mm : 13.30...13.40

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.40

2nd pressure hPa : 280

Rack travel in m: 10.40...10.50

3rd pressure hPa : 840

Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 160.0...162.0 1000 s: (157.0...165.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.30

rpm : 1230...1240 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 270.0...310.0

1000 s: (266.0...314.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Del.quantity cm3/: 27.5...32.5

1000 s: (25.0...35.0)

cm3 : 5.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

**APPLICATION** 

Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : SCA Edition : 21.05.92 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 965 Injection pump Pump designation : PE6P110A720RS3115 EP type number : 0 411 816 735 Governor Governor design. : RQV250...1100PA468-2 Governer no. : 0 421 814 006 Customer-spec, information Customer : SCANIA Engine : DN11 08 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina ( : 172...175 pressure, bar Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

Rack travel in mm : 9.00...12.00

: 3.30...3.40

: (3.25...3,45)

: 1-5-3-6-2-4

per values

BEGINNING OF DELIVERY

Prestroke mm

Firing order

Test pressure, bar: 25...27

Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 11.70...11.80 Del.quantity cm3/: 10.4...10.6 100 s: (10.2...10.8) Spread cm3 : 0.5100 s: (0.7) 2nd speed rpm : 250.0 Rack travel in mm: 4.4...4.8 Del.quantity cm3/: 1.2...1.6 100 s: (-) Spread cm3 : 0.2100 s: (0.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 travel mm : 1.20...1.60 2nd speed rpm : 350 travel mm : 2.40...3.00 3rd speed : 650 rpm travel mm : 4.60...5.20 4th speed : 1145 mar : 8.60...8.80 travel mm 5th speed : 1255 rpm : 9.70...10.10 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1125 Speed Rack travel in mm: 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Del.quantity : 104.0...106.0 1000 : (102.0...108.0) Spread cm3 : 5.00 1000 : (7.00)RATED SPEED

Phasing

: 0-60-120-180-240-300

1st version Control Lever position degrees: 113...121 Testina: 1st rack travel in: 10.70 Speed rpm : 1140...1150 2nd rack travel in: 4.00 Speed rpm : 1240...1270 4th rack travel in: 1400 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 62...70 Testing: Speed rpm : 100 Minimum rack trave: 6.00 rpm : 250 Rack travel in mm : 4.40...4.60 Rack travel in mm : 2.00 Speed irpin : 360...420 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1100 Del.quantity cm3/: 110.5...115.5 1000 s: (108.0...118.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed : 100 rpm Rack travel in mm : 11.70...11.80 LOW IDLE rpm : 250 Speed Rack travel in mm : 4.40...4.60 Remarks: Delivery—valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO

diaphragm.

APPLICATION

Omnibus

002

Note remarks

Test sheet : DAF

Edition : 31.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 846 966

Injection pump

Pump designation : PE6P110A720RS3225

EP type number : 0 411 816 763

Governor

Governor design. : RQV275...1050PA910-2

: D 421 814 012 Governer no.

Customer-spec. information

Customer : DAF

Engine : HT 168 A

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Irisp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - \*

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm: 12.30...12.40

Del.quantity cm3/: 12.0...12.2

100 s: (11.7...12.5)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm: 7.2...7.4

Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275

: 1.20...1.60 travel mm

2nd speed rpm : 375

travel mm : 2.80...3.30

3rd speed rpm : 450

: 3.50...4.00 travel mm

: 1000 4th speed rpm

travel mm : 7.00...7.40

5th speed rpm : 1090

travel mm : 8.00...8.20

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1180

Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

: 120.0...122.0 Del.quantity

1000 : (117.5...125.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control Lever position degrees: 115...123 Testing: 1st rack travel in: 11.30 rom : 1070...1080 Sneed 2nd rack travel in: 4.00 rpm : 1140...1170 Speed 4th rack travel in: 1260 Speed rpm : 0.00...1.40 LOW IDLE 1 Control lever position degrees: 79...87 Testing: Speed : 175 rom Minimum rack trave: 7.40 Speed rpm : 275 Rack travel in mm : 4.70...4.90 CONSTANT REGULATION Speed rpm : 275...425 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : 1000 Rack travel mm : 12.30...12.40 Measurement Speed 1/min: 600 1st pressure hPa : -Rack travel in m: 10.86...10.90 2nd pressure hPa : 400 Rack travel in m: 12.00...12.10
3rd pressure hPa : 320
Rack travel in m: 11.50...11.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/ : 83.5...85.5 1000 s: (81.0...88.0) BREAKAWAY 1st version 1mm rack travel less than

Speed rpm : 1070...1080 LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.70...4.90

Remarks:

004

full load rack tr: 11.30

Note remarks

Test sheet

MB

Edition

: 03.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 401 846 967

Injection pump

Pump designation : PE6P110A320LS3851-2

EP type number

: D 411 816 785

Governor

Governor design.

: RQV300...1050PA378

-12

Governer no.

: 0 421 814 016

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM441

1st version kW

: 151.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

**Overflow** 

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 101

*Openira* 

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,6

Test lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6,00x2,00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.40...4.50

: (4.35...4.55)

Rack travel in mm : 9.00...12.00 Firing order : 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

Spread

rpm: 1050

Rack travel in mm: 12.20...12.30

Del.quantity cm3/: 11.8...12.0

100 s: (11.5...12.2)

cm3 : 0.8

100 s: (1.3)

2nd speed rpm : 350.0

Rack travel in mm: 7.1...7.7 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4)

Spread

cm3 : 0.6100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.30...1.80 2nd speed

rpm : 430

travel mm : 2.90...3.40

3rd speed rpm : 590

: 3.90...4.40 travel mm rpm : 880

4th speed travel mm

: 5.70...6.10 : 1160

5th speed rpm

: 9.80...10.20 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130 Speed

Rack travel in mm : 9.90...12.50

FULL LOAD DELIV. AT FULL LOAD STOP

005

1st version

Speed rpm : 1050

Del.quantity : 118.0...120.0 1000 : (115.5...122.5)

Spread cm3 : 8.50

1000 : (13.00)

RATED SPEED

1st version Control Lever

position degrees: 116...124

Testing:

1st rack travel in: 11.20

Speed rom : 1990...1100

2nd rack travel in: 4.00

Speed rpm : 1140...1170

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1

Control Lever

position degrees: 67...75

Testing:

Speed rpm : 250

Minimum rack trave: 10.00

Speed rpm : 350

CONSTANT REGULATION

Speed rpm : 350...450

START CUT-OUT

Speed 1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm: 600

Del.quantity cm3/: 119.0...125.0

1000 s: (116.5...127.5)

Spread cm3 : 11.00

1000 s: (14.0)

Speed rpm : 1050

Del.quantity cm3/: 88.0...90.0 \*

1000 s: (85.5...92.5)

Spread cm3 : 11.00

1000 s: (14.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.20

006

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm: 100

Del.quantity cm3/: 130.0...150.0

1000 s: (126.0...154.0)

Remarks:

\* = Set at reduced-delivery stop.

Note remarks

Test sheet

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 401 848 824

Injection pump

Pump designation : PE8P110A320LS3842

EP type number

: 0 411 818 714

Governor

Governor design. : RQ300/1050PA1025

Governer no.

: 0 421 801 635

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM442

1st version kW

: 218.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

Firing order

: 4.00...4.10

: (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 8-7-2-6-3-5-

4-1

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 750

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.6...12.3

100 s: (12.3...13.0)

Spread

2nd speed

Spread

cm3 : 0.4

100 s: (0.7)

rpm : 300.0

Rack travel in mm: 8.2...8.5 Del.quantity cm3/: 1.5...2.1

100 s: (1.2...2.3)

cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 650

Rack travel in mm : 13.60...14.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 750

Del.quantity

: 126.0...128.0 1000 : (123.5...130.5)

Spread

cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

rpm

: 650

Rack travel in mm: 14.0

Testing:

1st rack travel in: 11.70

rpm : 1095...1110 Speed

2nd rack travel in: 4.00

Speed rpm : 1145...1175

4th rack travel in: 1350

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm : 6.9

Testina:

Speed rpm : 200 Minimum rack trave: 8.50 rpm : 300 Speed

Rack travel in mm : 6.80...7.00

Rack travel in mm : 2.00

Speed rpm : 400...440

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 750 LDU: hPa : 1100 Pressure

Rack travel mm : 12.70...12.80

Measurement

Speed 1/min: 750

1st pressure hPa : 910

Rack travel in m: 12.40...12.60

2nd pressure hPa : 760

Rack travel in m: 10.60...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1050 Del.quantity cm3/ : 136.0...140.0 1000 s: (133.0...143.0)

Spread cm3 : 7.00

1000 s: (10.0)

RACK STOP ADJUSTMENT

Speed rpm : 600

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

800

Note remarks

: MAN Test sheet Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 849 744A

Injection pump

Pump designation : PE10P120A520/4LS3849

EP type number : 0 411 829 708

Governor

Governor design. : RQ750PA663-7 : 0 421 801 331 Governer no.

Customer-spec. information : MAN Customer

: D2840 LE Engine

1st version kW : 405.0 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test Lines

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.20...4.30

: (4.15...4.35) Rack travel in mm : 9.00...12.00

: 10- 9- 4- 1- 8- 7-Firing order

6-3-5-2

Phasing : 0-45-72-117-144-189-

216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 850

Rack travel in mm: 12.50...12.60

Del.quantity cm3/: 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 4.5...4.9 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

cm3 : 0.8 Spread

100 s: (1.2)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

: 236.0...238.0 Del.quantity

1000 : (233.0...241.0)

Spread

cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Testing:

1st rack travel in: 11.50 Speed rpm : 900...905 2nd rack travel in: 4.00

rpm : 940...955 Speed 4th rack travel in: 1050

: 0.00...1.00 Speed rpm

Remarks:

: MAN-NR. 2-7976

## APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.00...4.10 Prestroke mm : (3.95...4.15) Note remarks Rack travel in mm : 9.00...12.00 : 10- 9- 4- 1- 8- 7 - 6- 3- 5- 2 Firing order Test sheet Edition : 31.07.92 Replaces Test oil : ISO-4113 : 0-45-72-117-144-189-216-261-288-333 Phasing Combination no. : 0 401 849 754 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PE10P110A320LS3844 Time to cyl. no. : 10 EP type number : 0 411 819 710 Governor BASIC SETTING Governor design. : R9300/1050PA1025-1 : 0 421 801 636 Governer no. 1st speed rpm : 750Customer-spec. information Rack travel in mm : 12.50...12.60 Customer : MERCEDES-BENZ Del.quantity cm3/ : 12.3...12.5 : OM 443 Engine 100 s: (12.0...12.7) : 271.0 1st version kW Rated speed : 2100 Spread cm3 : 0.4TEST BENCH REQUIREMENTS 100 s: (0.8) Test oil rpm : 300.02nd speed inlet temp. °C : 38...42 Rack travel in mm: 8.0...8.3 Del.quantity cm3/ : 1.5...2.1 Overflow valve 100 s: (1.2...2.3) : 1 417 413 025 cm3 : 0.4Spread 100 s: (0.7) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Overflow Control-lever position quantity min. 1/h: 130...150 Degree: -1 rpm : 650 Test nozzle holder Rack travel in mm : 13.60...14.40 : 0 681 343 009 assembly FULL LOAD DELIV. AT FULL LOAD STOP Opening | pressure, bar : 172...175 1st version Speed rpm : 750 Del.quantity : 123.0...125.0 Test lines : 1 680 750 089 1000 : (120.5...127.5) : 4.00 Spread cm3 Outside diameter 1000 : (8.00) x Wall thickness x Length mm : 8.00x2.50x600 RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values \_ Speed rpm : 650 Rack travel in mm : 14.0

Testina:

1st rack travel in: 11.50

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

: 1095...1110 Speed rpm 2nd rack travel in: 4.00 rpm : 1145...1175 Speed 4th rack travel in: 1300 rpm : 0.00...1.40 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.9 Testing: Speed rpm : 200 Minimum rack trave: 8.50 Speed rpm : 300 Rack travel in mm : 6.80...7.00 Rack travel in mm : 2.00 Speed rpm : 400...440 Aneroid/Altitude Compensator Test 1st version Setting Speed : 750 mon hPa : 1000 Pressure Rack travel mm : 12.50...12.60 Measurement 1/min : 750 Speed 1st pressure hPa : 910 Rack travel in m: 12.20...12.40 2nd pressure hPa : 760 Rack travel in m: 10.40...10.70 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1050 Del.quantity cm3/: 134.0...138.0 1000 s: (131.0...141.0) Spread cm3 : 6.001000 s: (9.00) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1095...1110 Speed STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0)

Remarks:

012

Speed

Note remarks

Test sheet : HAE

Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 401 856 159

Injection pump

Pump designation : PE6P110A721RS369 EP type number : 0 411 816 121

Governor

Governor design. : RQ300/1300PA412-6

: 0 421 801 638 Governer no.

Customer-spec. information Customer : HAEP

Engine : WD615.60

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1300

Rack travel in mm: 14.10...14.20

Del.guantity cm3/: 14.6...14.8

100 s: (14.3...15.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm: 8.8...9.2

Del.quantity cm3/: 1.8...2.4

100 s: (1.5...2.6)

Spread cm3 : 0.4190 s: (0.7)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

Speed rpm : 500

Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300 Aneroid pressure h: 700

Del.quantity : 146.0...148.0

1000 : (143.5...150.5)

Spread

cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm: 16.0

Testing:

1st rack travel in: 13.10

rpm : 1345...1360 Speed

2nd rack travel in: 4.00

rpm : 1425...1455 Speed

4th rack travel in: 1550

Speed rpm : 0.00...1.00 LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.0

Testing:

rpm : 100 Speed Minimum rack trave: 7.40 rpm : 300 Speed

Rack travel in mm : 5.90...6.10

Rack travel in mm: 2.00 rom : 400...440 Speed

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 14.10...14.20

2nd speed rpm : 700

Rack travel in m: 14.60...15.00

3rd speed rpm : 900

Rack travel in m: 14.50...14.70

4th speed rpm : 1100

Rack travel in m: 14.30...14.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 700 Speed rom Pressure hPa : 700

Rack travel mm : 14.30...14.50

Measurement

Speed 1/min: 700

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 310

Rack travel in m: 14.10...14.20

3rd pressure hPa : 205

Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700 Del.quantity cm3/: 135.0...139.0 1000 s: (132.0...142.0)

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 101.0...103.0

1000 s: (98.5...105.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.10

Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0 1000 s: (131.0...159.0)

Rack travel in mm : 16.50...17.50

Remarks:

D14

Note remarks

Test sheet

: HAE

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 401 856 706

Injection pump

Pump designation : PE6P110A721RS3101

EP type number

: 0 411 816 725

Governor

Governor design. : RQ300/1200PA412-7

Governer no.

: 0 421 801 639

Customer

Customer-spec. information : HAEP

Engine

: WD615.67

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1200

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 16.2...16.4

100 s: (15.9...16.7)

Spread

cm3 : 0.4

100 s: (0.7)

2nd speed

rpm : 300.0

Rack travel in mm: 5.5...5.9

Del.quantity cm3/: 1.2...1.8

100 s: (0.9...2.0)

Spread

cm3 : 0.4100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm: 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1200

Aneroid pressure h: 700

Del.quantity

: 162.0...164.0 1000 : (159.0...167.0)

Spread

: 4.00 cm3 1000 : (7.50)

RATED SPEED

1st version

Setting point: Speed

: 600

Rack travel in mm: 16.0

Testing:

1st rack travel in: 10.50

Speed

rpm : 1245...1260

2nd rack travel in: 4.00

rpm : 1315...1345 Speed

4th rack travel in: 1450

Speed

rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Speed Rack travel in mm: 5.7

Testing:

rpm : 100 Speed Minimum rack trave: 7.20

Speed rpm : 300
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00

rpm : 405...445 Speed

TORQUE CONTROL

Dimension a mm : 0.35

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 11.50...11.60

2nd speed rpm : 600

Rack travel in m: 12.10...12.40

3rd speed rpm : 985 Rack travel in m: 11.90...12.10

4th speed rpm : 1075

Rack travel in m: 11.70...11.90

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 700 MCC

hPa : 700 Pressure

Rack travel mm : 11.90...12.10

Measurement

1/min: 700 Speed

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 420

Rack travel in m: 11.00...11.10

3rd pressure hPa : 330

Rack travel in m: 9.80...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

rpm : 700 Speed

Del.quantity cm3/: 165.0...169.0

1000 s: (163.0...171.0)

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/: 112.0...114.0 1000 s: (109.5...116.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.50

Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed nom : 100

Del.quantity cm3/: 205.0...235.0

1000 s: (201.0...239.0) Rack travel in mm : 18.50...19.50

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Time to cyl. no. : 6 Note remarks BASIC SETTING : CRM Test sheet rpm: 1000 1st speed Edition : 24.07.92 Replaces Rack travel in mm : 12.00...12.10 Test oil : ISO-4113 Del.quantity cm3/: 24.1...24.3 Combination no. : 0 401 866 035 100 s: (23.8...24.6) Injection pump Pump designation : PES6P120A720/3LS122 Spread cm3 : 0.7 EP type number : 0 411 826 050 Governor 100 s: (0.9) Governor design. : RSUV300...1050P0A325 Governer no. : 0 421 829 066 2nd speed rpm : 300.0 Rack travel in mm : 5.8...6.2 Del.quantity cm3/ : 2.9...3.9 TEST BENCH REQUIREMENTS 100 s: (2.6...4.2) Test oil cm3 : 0.4Spread inlet temp. °C : 38...42 100 s: (-) Overflow valve GUIDE SLEEVE POSITION : 1 417 413 025 Control-lever position Degree: -3 Inlet press., bar: 1.50 Speed rpm : 800 Rack travel in mm : 0.30...1.00 Test nozzle holder : 0 681 443 022 assembly Governor spring pre-tension Click setting x : 5.25Opening pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Test lines : 1 680 750 060 Speed rpm : 1000: 241.0...243.0 Del.quantity Outside diameter 1000 : (238.0...246.0) cm3 : 7.50 1000 : (9.00) x Wall thickness Spread x Length mm : 8.00x2.00x1000 (A) Injection pump setting values RATED SPEED Insp. values in parentheses Set equal delivery quant. 1st version per values Control lever position degrees: 110...118 BEGINNING OF DELIVERY Test pressure, bar: 30...32 Testing: 1st rack travel in: 11.00 Prestroke mm : 2.00...2.10 rpm : 1045...1055 Speed : (1.95...2.15) 2nd rack travel in: 4.00 Speed rpm : 1070...1100 3rd rack travel in: 4.00 Rack travel in mm : 9.00...12.00 : 1-4-2-6-3-5 Firing order : 1080...1110 Speed rpm 4th rack travel in: 1250 Speed rpm : 0.30...1.70Phasing : 0-60-120-180-240-300 LOW IDLE 1

Control lever

position degrees: 66...74

Tolerance + - °

: 0.50 (0.75)

Setting point w/out bumper spring

Speed rpm : 200 Rack travel in mm: 6.0

Testing:

rpm : 100 Speed Minimum rack trave: 8.00 Speed rpm : 200

Rack travel in mm : 6.40...6.60

Rack travel in mm: 2.00 Speed rpm: 280...340

SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00

TOPQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 12.00...12.10

2nd speed rpm : 500 Rack travel in m: 12.00...12.20 5th speed rpm : 250 Rack travel in m: 13.20...13.80

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.00

Speed rpm : 1045...1055

## LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.80...6.20

Del.quantity cm3/: 29.0...39.0 1000 s: (26.0...42.0)

Spread cm3 : 4.00

Remarks:

Note remarks

: PEN 6,1 q 1 : 24.07.92 Test sheet Edition : 03.90 Replaces

Test oil : ISO-4113

Combination no. : 0 401 876 340

Injection pump

Pump designation : PE6P110A320RS499 EP type number : 0 411 816 169

Governor

Governor design. : RSV325...1400PDA374-

Governer no. : 0 421 833 335

Customer-spec. information Customer : PENTA

: TAMD61 Engine

: 221.0 1st version kW : 2800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.40...2.50 : (2.35...2.55) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 11.9...12.1

100 s: (11.6...12.4)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 325.0 2nd speed Rack travel in mm: 4.1...4.3 Del.quantity cm3/: 1.1...1.5

100 s: (0.9...1.7)

cm3 : 0.3Spread

100 s: (0.6)

GUIDE SLEEVE POSITION Control-lever position

> Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 900

: 119.0...121.0 Del.quantity

1000 : (116.0...124.0) : 4.00 cm3

Spread 1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 114...122

Testing:

1st rack travel in: 10.10

rpm : 1450...1460 Speed

Prestroke mm

2nd rack travel in: 4.00

Speed rpm : 1525...1555 4th rack travel in: 1630

rpm : 0.30 ... 1.40 Speed

LOW IDLE 1 Control lever

position degrees: 79...87

Setting point wout bumper spring

npm : 325 Rack travel in mm: 3.7

Testing:

Speed rpm : 100

Speed : 325 HOM

Rack travel in mm : 4.10...4.30

Rack travel in mm: 2.00

Speed rpm : 450...510

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rion: hPa : 900 Pressure

Rack travel mm : 11.00...11.20

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 8.60...8.80

2nd pressure hPa : 370

Rack travel in m: 8.80...8.90

3rd pressure hea : 720

Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1400 Del.quantity cm3/: 121.0...125.0 1000 s: (118.0...128.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 55.0...57.0

1000 s: (52.0...60.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1450...1460

020

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.10...4.30

Del.quantity cm3/: 11.0...15.0 1000 s: (9.0...17.0) cm3 : 3.00 1000 s: (6.00)

Spread

Remarks:

**APPLICATION** 

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 11,9 U Edition : 31.07.91 : 26.02.91 Replaces : ISO-4113 Test oil Combination no. : 0 402 036 741 Injection pump Pump designation: PES6P120A720/3LS3255 EP type number : 0 412 026 739 Governor Governor design. : RQV300...1000PA876-6 Governer no. : 0 421 813 866 Customer-spec. information Customer : MAN Engine : D2866LF03 1st version kW : 273.0 : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 3.70...3.80 : (3.65...3.85) Rack travel in mm : 14.50...15.50 Firing order : 6-2-4-1-5-3

11 ing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/: 24.2...24.4

100 s: (23.9...24.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 4.7...5.1 Del.quantity cm3/ : 1.7...2.3 100 s: (1.4...2.6)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045

travel mm : 9.90...10.10

2nd speed rpm : 300

travel mm : 1.50...1.70

500

3rd speed rpm:

travel mm : 3.30...3.90

4th speed rpm : 800

travel mm : 6.80...7.20

5th speed rpm : 1300

trayel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position Degree: -1

Speed rpm: 1060

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

cm3 : 5.00 Spread 10000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 298...306

Testing:

1st rack travel in: 13.60

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

rpm : 1125...1155 Speed

4th rack travel in: 1300

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 256...264

Testing:

Spec-d : 200 rom Minimum rack trave: 6.40 Speed rpm : 300

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

rpm : 290...400 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 700

Rack travel in m: 15.00...15.10

2nd speed rpm : 1000

Rack travel in m: 14.60...14.70

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 man hPa : 1200 Pressure

: 15.00...15.10 Rack travel mm

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 110 Rack travel in m: 12.00...12.10

3rd pressure hPa : 470

Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rom: : 1000 Speed

Del.quantity cm3/: 236.0...242.0

1000 s: (233.0...245.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.60

rpm : 1040...1050 Speed

INTERMEDIATE RATED SPEED Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm

Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 4.70...5.10 Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MAN-NR. 0-7051

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6

start of delivery

Note remarks

Test sheet

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 646 930

Injection pump

Pump designation: PE6P120A320LS7834-10

EP type number

: 0 412 626 853

Governor

Governor design. : RQ300/1050PA972-7

Governer no.

: 0 421 801 583

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

: 230.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0.8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

Spread

rpm : 550

Rack travel in mm : 15.20...15.40

Del.quantity cm3/: 24.0...24.2

100 s: (23.7...24.5)

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 6.3...6.9

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 550

Aneroid pressure h: 1200

Del.quantity

: 240.0...242.0 1000 : (237.0...245.0)

Spread

cm3 : 6.00 1000 : (9.00)

RATED SPEED

1st version

Speed

Setting point:

Rack travel in mm : 20.0

rpm

D23

Testing:

1st rack travel in: 13.90

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

rpm : 1170...1200 Speed

4th rack travel in: 1300

rpm : 0.00...1.40 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Speed Rack travel in mm: 6.6

Testing:

Speed rpm : 200

Minimum rack trave: 8.70

: 300 rpm Rack travel in mm : 6.50...6.70

Rack travel in mm: 2.00

Speed rom : 380...420

TORQUE CONTROL

Dimension a mm : 0.35

2nd speed rpm : 1050

Rack travel in m: 14.90...15.10

3rd speed rpm : 800

Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Sneed COM hPa : 1200 Pressure

Rack travel mm : 15.20...15.40

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.40 2nd pressure hPa : 250 Rack travel in m: 10.60...10.70

3rd pressure hPa : 750

Rack travel in m: 13.80...14.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1050 Del.quantity cm3/ : 234.0...237.0 1000 s: (231.0...240.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Spread

Speed

rpm : 500

Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 40.0...70.0 1000 s: (36.0...74.0)

Remarks:

Governor is equipped with a

temperature-sensitive starting device.

D24

Note remarks

Test sheet : MB

Edition : 26.06.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 646 930X

Injection pump

Pump designation : PE6P120A320LS7834-10

EP type number : 0 412 626 853

Governor

Governor design. : RQ300/1050PA972-7

Governer no. : 0 421 801 583

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 230.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)
Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ}$  : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 15.20...15.40

Del.quantity cm3/: 24.0...24.2

100 s: (23.7...24.5)

Spread cm3: 0.6

100 s: (0.9)

2nd speed rom : 300.8

Rack travel in mm : 6.3...6.9 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rom: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm : 550

Aneroid pressure h: 1200

Del.quantity : 240.0...242.0

1000 : (237.0...245.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0 Testing:

1st rack travel in: 13.90

Screed rpm : 1090...1105

2nd rack travel in: 4.00

rpm : 1170...1200 Speed

4th rack travel in: 1300

rpm : 0.00...1.40 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.6

Testing:

Speed rpm : 200 Minimum rack trave: 8.70

rpm : 300

Rack travel in mm : 6.50...6.70

Rack travel in mm: 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.35

: 1050 2nd speed **COU** 

Rack travel in m: 14.90...15.10

3rd speed rpm : 800

Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 COM Pressure hPa : 1200

Rack travel mm : 15.20...15.40

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 10.10...10.40

2nd pressure hPa : 250

Rack travel in m: 10.60...10.70 3rd pressure hPa : 750

Rack travel in m: 13.80...14.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 1050

Del.quantity cm3/: 234.0...237.0

1000 s: (231.0...240.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

cm3 : 8.00 1000 s: (12.0) Spread

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90

rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quaritity cm3/ : 40.0...70.0

1000 s: (36.0...74.0)

Remarks:

Governor is equipped with a

temperature-sensitive starting device.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 11,7 n : 31.07.92 Test sheet Edition : 02.92 Replaces : ISO-4113 Test oil Combination no. : 0 402 646 936 Injection pump Pump designation : PE6P120A320RS7230 EP type number : 0 412 626 843 Governor Governor design. : RQV250...1000PA990K : 0 421 815 274 Governer no. Customer-spec. information Customer : DAF : WS 315 G Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 D25 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina . : 207...210 pressure, bar Orifice plate : 0,8 diameter mm : 1 680 750 089 Test lines Outside diameter x Wall thickness : 8.00x2.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.00...5.10

Rack travel in mm: 13.80...14.80

: (4.95...5.15)

Firing order : 1-5-3-6-2-4 Phasina : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 980 Rack travel in mm: 14.20...14.30 Del.guantity cm3/: 26.4...26.6 100 s: (26.1...26.9) cm3 : 0.5Spread 100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm: 5.8,..6.0 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 1.30...1.70 travel mm rpm : 285 2nd speed : 2.10...2.50 travel mm 3rd speed rpm : 685 : 6.20...6.60 travel mm 4th speed rpm : 1030 travel mm : 9.60...10.00 5th speed rpm : 1145 : 11.20...11.40 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1130 Rack travel in mm : 12.90...15.50 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 980 Speed Aneroid pressure h: 1500 Del.quantity : 204.0...269.0)

Prestroke mm

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 60...68 Testina: 1st rack travel in: 13.20 rpm : 1030...1040 Speed 2nd rack travel in: 4.00 : 1140...1170 Speed rpm 4th rack travel in: 1275 Speed rpm : 0.00...1.40LOW IDLE 1 Control lever position degrees: 16...24 Testina: Speed rpm : 100 Minimum rack trave: 6.70 rpm : 250 Rack travel in mm: 5.10...5.30 Rack travel in mm: 2.00 Speed rpm : 310...350 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 500 Rack travel in m: 13.00...13.10 2nd speed rpm : 600 Rack travel in m: 13.00...13.20 rpm : 750 3rd speed Rack travel in m: 13.40...13.60 rpm : 825 4th speed Rack travel in m: 13.80...14.00 rpm : 980 5th speed Rack travel in m: 14.80...15.00 Aneroid/Altitude Compensator Test 1st version Setting Speed : 980 L DW hPa : 1500 Pressure Rack travel mm : 14.20...14.30 Measurement

1/min: 980

Rack travel in m: 8.80...9.00

Rack travel in m: 11.80...11.90

1st pressure hPa : -

2nd pressure hPa : 630

3rd pressure hPa : 340 Rack travel in m: 9.60...9.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 rrm : 500 Speed Del.quantity cm3/: 288.0...292.0 1000 s: (285.0...295.0) Spread cm3 : 8.00 1000 s: (12.) Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 162.0...164.0 1000 s: (159.0...167.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 1030...1040 Speed LOW IDLE Speed rpm : 250 Rack travel in mm : 5.10...5.30 Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Speed

Note remarks

Test sheet : MB 9,6 r 1 Edition : 26.06.92 Replaces : 01.92 Test oil : ISO-4113

Combination no. : 0 402 646 939

Injection pump

Pump designation: PE6P120A320LS7836-10

EP type number : 0 412 626 854

Governor

Governor design. : RQV300...950PA797-31

Governer no. : 0 421 813 922

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 200.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2,50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00 : 6-3-5-2-4-1

Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 5.3...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

travel mm : 1.00...1.50

2nd speed rpm : 617

5.00...5.50 travel mm

rpm : 7803rd speed

travel mm : 6.10...6.60

rpm : 1009 4th speed

travel mm : 8.30...8.80

5th speed rpm : 1092

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1020 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Rack travel in m: 12.60...12.80 Speed rpm : 600 4th pressure hPa : 1150 Aneroid pressure h: 800 Rack travel in m: 12.90...13.10 Del.quantity : 182.0...187.0) 5th pressure hPa : -Rack travel in m: 10.30...10.60 cm3 : 5.00 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 240 (260) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 118...126 1st version Testing: Aneroid pressure h: 1400 1st rack travel in: 12.10 rpm : 950 Speed Del.quantity cm3/: 203.0...206.0 Speed rpm : 990...1000 2nd rack travel in: 4.00 1000 s: (200.0...209.0) rpm : 1075...1105 Speed Spread cm3 : 8.00 4th rack travel in: 1200 1000 s: (12.0) rom : 0.00...1.00Speed Aneroid pressure h: 1400 Speed : 800 rpm Del.quantity cm3/: 202.0...206.0 LOW IDLE 1 Control lever 1000 s: (199.0...209.0) position degrees: 82...90 Spread cm3 : 8.00 1000 s: (12.0) Testina: Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 132.0...134.0 1000 s: (129.0...137.0) Speed rpm : 200 Minimum rack trave: 7.40 rpm : 300 Speed Rack travel in mm: 5.50...5.70 Spread cm3 : 8.00 1000 s: (12.0) CONSTANT REGULATION Speed rpm : 300...450 **BREAKAWAY** TORQUE CONTROL Dimension a mm 1st version 2nd speed rpm : 950 1mm rack travel less than Rack travel in m: 13.10...13.30 3rd speed rpm : 800 full load rack tr: 12.10 Rack travel in m: 13.10...13.30 rpm : 990...1000 Speed Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test Speed rpm : 100 Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0) 1st version Setting Speed : 600 rpm Pressure hPa : 800 Remarks: Rack travel mm : 12.40...12.50 Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 10.90...11.10 2nd pressure hPa : 400 Rack travel in m: 11.80...12.00 3rd pressure hPa : 1000

Note remarks

Test sheet : MB 9,6 q 1 : 26.06.92 Edition Replaces : 03.92 Test oil : ISO-4113

Combination no. : 0 402 646 940

Injection pump

Pump designation : PE6P12OA32OLS7836-10

EP type number : 0 412 626 854

Governor

Governor design. : RQ300/950PA971-7 : 0 421 801 580 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 200.0 Rated speed : 1900

TEST BENCH REQUIREMENT'S

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65) Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.3...5.9

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600

Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 800

Del.quantity : 182.0...184.0

1000 : (179.0...187.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 rpm Rack travel in mm : 20.0

Testina: 1st rack travel in: 12.10 Speed nom : 999...1005 2nd rack travel in: 4.00 Speed rpm : 1065...1095 4th rack travel in: 1200 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.6 Testing: Speed rom : 200 Minimum rack trave: 7.40 rpm : 300 Rack travel in mm : 5.50...5.70 Rack travel in mm: 2.00 : 370...410 Speed rpm Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 600 Pressure hPa : 800 : 12.40...12.60 Rack travel mm Measurement Speed 1/min : 600 1st pressure hPa : 250 Rack travel in m: 10.90...11.10 2nd pressure hPa : 400 Rack travel in m: 11.80...12.00 3rd pressure hPa : 1000 Rack travel in m: 12.60...12.80 4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : -Rack travel in m: 10.10...10.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed : 950 rpm Del.quantity cm3/: 203.0...206.0 1000 s: (200.0...209.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1400 Speed rpm : 800 Del.quantity cm3/ : 202.0...206.0

1000 s: (199.0...209.0)

Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.10 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 45.0...75.0 1000 s: (41.0...79.0) Rack travel in mm : 10.30...10.60

Remarks:

E04

Note remarks

Test sheet : UNI 13,8 h1 Edition : 21.05.92

Replaces : 09.91 Test oil : ISO-4113

Combination no. : 0 402 646 946

Injection pump

Pump designation : PE6P130A720RS7225 EP type number : 0 412 636 817

Governor

Governor design. : RQV300...975PA1002K

Governer no. : 0 421 815 279

Customer-spec. information Customer : IVECO-UNIC

Engine : 8210.42.009

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test Lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 11.50...12.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. rio. : 1

BASIC SETTING

1st speed rpm: 975

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 26.9...27.2

100 s: (26.5...27.5)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0 Rack travel in mm: 3.8...4.2

Del.quantity cm3/: 1.9...2.5

100 s: (1.5...2.9) cm3 : 1.0 Spread

100 s: (1.4)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1020

: 9.90...10.10 travel mm

2nd speed rpm : 300

: 1.60...2.00 travel mm

3rd speed rpm : 400

travel mm : 3.40...4.00

4th speed rpm : 600

: 5.20...5.60 travel mm

5th speed rpm : 1250

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1045 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rom : 975

Aneroid pressure h: 900

Del.quantity : 209.0...275.5)

E05

Spread cm3 : 6.00 1000 : (10.00)

RATED SPEED

1st version Control Lever

position degrees: 114...122

Testina:

1st rack travel in: 10.90 Speed rpm : 1015...1025

2nd rack travel in: 4.00

rpm : 1075...1105 Speed

4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 66...74

Testing:

Speed rpm : 100 Minimum rack trave: 5.40 rpm : 300

Rack travel in mm: 3.90...4.10

CONSTANT REGULATION

Speed rpm : 280...400

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 975

Rack travel in m: 11.90...12.00

2nd speed rom : 800

Rack travel in m: 11.60...11,80

3rd speed rpm : 500

Rack travel in m: 10.50...10.90

Aneroid/Altitude Compensator Test

1st version Setting

rpm : 975 hPa : 900 Speed Pressure

Rack travel mm : 11.90...12.00

Measurement

Speed 1/min: 975

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 490

Rack travel in m: 11.20...11.30

3rd pressure hPa : 290

Rack travel in m: 9.80...10.00

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 500 Speed

Del.quantity cm3/: 239.0...247.0 1000 s: (235.5...250.5)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 196.0...199.0 1000 s: (192.5...202.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.90

Speed rpm : 1015...1025

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 125.0...155.0 1000 s: (121.0...159.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 3.80...4.20 Del.quantity cm3/: 19.0...25.0

1000 s: (15.0...29.0)

cm3 : 10.00 Spread

1000 s: (14.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : UNI 13,8 h2 Edition : 03.07.92 Replaces : 11.91 Test oil : ISO-4113 Combination no. : 0 402 646 947 Injection pump Pump designation: PE6P130A720RS7225 EP type number : 0 412 636 817 Governor Governor design. : RQV300...950PA1002 -1K : 0 421 815 280 Governer no. Customer—spec. information Customer : IVECO-UNIC Engine : 8210.42.400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.00...5.10 : (4.95...5.15) E07

Rack travel in mm : 13.50...14.50 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed inpra : 900 Rack travel in mm : 13.00...13.10 Del.quantity cm3/: 31.3...31.5 100 s: (31.0...31.8) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 300.0 Rack travel in mm: 4.0...4.4 Del.quantity cm3/: 1.9...2.5 100 s: (1.6...2.8) Spread cm3 : 0.8 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 995 travel mm : 8.50...8.70 rpm : 300 2nd speed travel mm : 1.00...1.40 3rd speed 500 rpm : 3.30...3.90 travel mm : 750 4th speed rpm 5.80...6.20 travel mm 1300 5th speed rpm travel mm : 13.00...14.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1125 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Aneroid pressure h: 900 Del.quantity : 313.0...318.0)

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 112...120 Testing: 1st rack travel in: 12.00 Speed rpm: 990...1000 2nd rack travel in: 4.00 rpm : 1100...1130 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 66...74 Testing: Speed rom : 100 Minimum rack trave: 5.70 : 300 מוכניו Rack travel in mm : 4.00...4.40 CONSTANT REGULATION rpm : 340...460 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 900 1st speed Rack travel in m: 13.00...13.10 2nd speed Rack travel in m: 12.70...12.90 rom : 550 3rd speed Rack travel in m: 12.00...12.20 4th speed rpm : 300 Rack travel in m: 11.20...11.70 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 900 Pressure hPa : 900 Rack travel mm : 13.00...13.10 Measurement Speed 1/min: 900 1st pressure hPa : -Rack travel in m: 9.30...9.50 2nd pressure hPa : 560 Rack travel in m: 11.50...11.60 3rd pressure hPa : 350

Rack travel in m: 9.70...10.10 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 700 Del.quantity cm3/ : 317.0...321.0 1000 s: (314.0...324.0) Aneroid pressure h: 900 rpm : 550 Del.quantity cm3/: 286.0...292.0 1000 s: (283.0...295.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 182.0...184.0 1000 s: (179.0...187.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.00 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rom : 100 Del.quantity cm3/: 125.0...155.0 1000 s: (121.0...159.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.00...4.40 Del.quantity cm3/: 19.0...25.0 1000 s: (16.0...28.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : SCA : 24.07.92 Edition Replaces Test oil : ISO-4113 Combination no. : 0 402 646 951 Injection pump EP type number : 0 412 626 832 Governor Governer no. : 0 421 801 579 Customer-spec. information Customer : SCANIA Engine : DSC 11 77 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 104 Opening pressure, bar : 250...253 Orifice plate diameter nm : 0,7 Test lines : 1 680 750 008 Outside diameter x Wall thickness : 6.90X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses

Pump designation : PE6P12OA72ORS7188 Governor design. : RQ200/950PA745-3 Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 4.40...4.50 : (4.35...4.55) Rack travel in mm: 9.00...12.00 E09

Firing order : 1-5- 3- 6- 2- 4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 17.0...17.2 100 s: (16.8...17.4) Spread cm3 : 0.6100 s: (0.9) 2nd speed rpm : 225.0 Rack travel in mm: 4.5...5.3 Del.quantity cm3/: 1.2...1.6 100 s: (-) cm3 : 0.5Spread 100 s: (0.8) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Aneroid pressure h: 900 Del.quantity : 170.0...172.0 1000 : (168.0...174.0) Spread cm3 : 6.00 1000 : (9.00) RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 16.5 Testing: 1st rack travel in: 11.70 rpm : 995...1010 Speed 2nd rack travel in: 4.00 rpm : 1110...1140 Speed

4th rack travel in: 1250

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225 Rack travel in mm: 4.7

Testing:

Speed rpm : 100 Minimum rack trave: 6.20 rpm : 225 Speed

Rack travel in mm : 4.60...4.80

Rack travel in mm: 2.00 Speed rom : 300...360

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 900 Pressure

: 11.10...11.30 Rack travel mm

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.70

2nd pressure hPa : 420 Rack travel in m: 10.70...10.80

3rd pressure hPa : 280

Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm: 950 Del.quantity cm3/: 170.0...172.0 1000 s: (168.0...174.0)

Ameroid pressure h: -Speed rpm : 500

Del.quantity cm3/: 120.0...124.0

1000 s: (118.0...126.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70

Speed rpm : 995...1010

STARTING FUEL DELIVERY

rpm : 100 Speed Rack travel in mm : 9.30...9.70

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.50...5.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

**APPLICATION** 

**Omnibus** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 9,6 q 6 Edition : 31.07.92 Replaces : 01.92 Test oil : ISO-4113 Combination no. : 0 402 646 952 Injection pump Pump designation: PE6P120A320LS7836-10 EP type number : 0 412 525 854 Governor Governor design. : RQ300/1050PA972-8 : 0 421 801 626 Governer no. Customer-spec, information Customer : MERCEDES-BENZ Engine : 0M401 LA 1st version kW : 180.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Opening | pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm

(A) Injection pump setting values

per values \_\_\_\_

Insp. values in parentheses Set equal delivery quant.

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1 Phasina : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm : 600 Rack travel in mm : 11.70...11.90 Del.quantity cm3/: 16.4...16.6 100 s: (16.1...16.9) cm3 : 0.5Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 5.3...5.9 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6 Spread 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 700 Del.quantity : 164.0...166.0 1000 : (161.0...169.0) Spread cm3 : 5.00 1000 : (9.00)RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60

rpm : 1090...1105

2nd rack travel in: 4.00

Speed rpm : 1165...1195 4th rack travel in: 1300

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 5.6

Testing:

Speed : 200 rpm Minimum rack trave: 7.40

speed rpm : 300 Rack travel in mm : 5.50...5.70 Rack travel in mm : 2.00 Speed rpm

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 600 rom Pressure hPa : 700

: 11.70...11.90 Rack travel mm

Measurement

Speed 1/min : 600

1st pressure hPa : 180

Rack travel in m: 10.40...10.60

2nd pressure hPa : 280

Rack travel in m: 11.30...11.50

3rd pressure hPa : 900

Rack travel in m: 11.80...12.00 \*

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

Speed : 1050 l'ipm

Del.quantity cm3/: 182.0...185.0 1000 s: (179.0...188.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1400

Speed : 800 rpm

Del.quantity cm3/: 186.0...190.0

1000 s: (183.0...193.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed : 500 rpm

Del.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

cm3 : 8.00 Spread

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 50.0...80.0

1000 s: (46.0...84.0)

Rack travel in mm : 10.60...10.90

Remarks:

\* Increase in control-rod travel with respect to setting at Least 0.1 mm

Note remarks

Test sheet : MB

Edition : 26.06.92 Replaces : 01.92 Test oil : ISO-4113

Combination no. : 0 402 646 953

Injection pump

Pump designation: PE6P120A320LS7836-10

EP type number : 0 412 626 854

Governor

Governor design: : RQ300/950PA971-8 Governor no: : 0 421 801 625

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet remp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter × Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

(5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.70...11.90

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.3...5.9

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 600 Aneroid pressure h: 700

Del.quantity : 164.0...166.0 1000 : (161.0...169.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testina: 1st rack travel in: 11.50 rpm : 990...1005 Speed 2nd rack travel in: 4.00 Speed rpm : 1065...1095 4th rack travel in: 1100 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring : 300 rom Rack travel in mm: 5.6 Testina: rpm : 200 Speed Minimum rack trave: 7.40 Speed rpm : 300
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed Speed rpm : 370...410 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 700 Pressure Rack travel mm : 11.70...11.90 Measurement Speed 1/min: 600 1st pressure hPa : 180 Rack travel in m: 10.40...10.60 2nd pressure hPa : 280 Rack travel in m: 11.30...11.50 3rd pressure hPa : 900 Rack travel in m: 11.80...12.00 \* 4th pressure hPa : 1100 Rack travel in m: 12.20...12.40 5th pressure hPa : -Rack travel in m: 10.30...10.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 : 950 rpm Del.quantity cm3/: 187.0...190.0 1000 s: (184.0...193.0)

cm3 : 8.00

1000 s: (187.0...197.0)

Speed rpm : 800 Del.quantity cm3/ : 190.0...194.0

1000 s: (12.0) Aneroid pressure h: 1400 Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 132.0...134.0 1000 s: (129.0...137.0) Spread cm3 : 8.00 1000 s: (12.0)

## **BREAKAWAY**

1st version 1mm rack traval less than

full load rack tr: 11.50 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 10.30...10.60

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : MB Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 954

Injection pump

Pump designation: PE6P120A320LS7834-10

EP type number : 0 412 626 853

Governor

Governor design. : RQ300/1050PA993-5 Governer no. ; 0 421 801 610

Customer spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

: 213.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2,50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.70...13.90

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 800

Del.quantity : 209.0...214.0)

: 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point: Speed COM Rack travel in mm : 20.0 Testing:

1st rack travel in: 13.00

Speed rpm : 1090...1105

2nd rack travel in: 4.00

rpm : 1175...1205 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.2

Testing:

Speed : 200 rom Minimum rack trave: 7.50

: 300 rpm

Rack travel in mm : 6.10...6.30

Rack travel in mn: 2.00

Speed : 380...420 rom

TORQUE CONTROL

Dimension a mm 2nd speed rpm : 1050

Rack travel in m: 14.00...14.20

rpm : 800 3rd speed

Rack travel in m: 14.10...14.30

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 600 rom Pressure hPa : 800

Rack travel mm : 13.70...13.90

Measurement

1/min: 600 Speed

1st pressure hPa : 250

Rack travel in m: 10.30...10.50

2nd pressure hPa : 550

Rack travel in m: 12.90...13.10

3rd pressure hPa : 1100

Rack travel in m: 13.80...14.00

4th pressure hPa : -

Rack travel in m: 9.50...9.80

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

rpm : 1050 Speed

Del.quantity cm3/: 216.0...219.0

1000 s: (213.0...222.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1500

: 800 Speed man

Del.quantity cm3/: 219.0...223.0 1000 s: (216.0...226.0)

Spread cm3 : 8.00 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full toad rack tr: 13.00

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 210.0...230.0

1000 s: (206.0...234.0)

Remarks:

\* Increase in control-rod travel with

respect to setting at least 0.1 mm

Note remarks

Test sheet

: MB Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 957

Injection pump

Pump designation : PE6P120A320LS7836-10

EP type number

: 0 412 626 854

Governor

Governor design. : RQV300...1050PA797

-32

: 0 421 813 957 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 180.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.70...11.90

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.3...5.9
Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.50...1.00

2nd speed rpm : 830

: 5.90...6.40 rpm : 1107 travel mm

3rd speed

travel mm : 8.10...8.60

rpm : 1190 4th speed

: 9.80...10.30 travel mm

5th speed rpm : 1290

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speea Aneroid pressure h: 700 Del.quantity : 164.0...166.0 1000 : (161.0...169.0) : 5.00 Spread cm3 1000 : (9.00)RATED SPEED 1st version Control Lever position degrees: 116...124 Testing: 1st rack travel in: 11.30 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1165...1195 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 78...86 Testing: Speed : 200 rpm Minimum rack trave: 7.40 : 300 rpm Rack travel in mm : 5.50...5.70 CONSTANT REGULATION rpm : 300...400 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm Pressure hPa : 700 Rack travel mm : 11.70...11.90 Measurement Speed 1/min: 600 1st pressure hPa : 180 Rack travel in m: 10.40...10.60 2nd pressure hPa : 280 Rack travel in m: 11.30...11.50 3rd pressure hPa : 900 Rack travel in m: 11.80...12.00 \* 4th pressure hPa : 1100 Rack travel in m: 12.10...12.30

START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed rpm : 1050 Del.quantity cm3/ : 182.0...185.0 1000 s: (179.0...188.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1400 : 800 Speed rpm Del.quantity cm3/: 186.0...190.0 1000 s: (183.0...193.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0) Remarks: \* Increase in control-rod travel with respect to setting at least 0.1 mm

5th pressure hPa : -

Rack travel in m: 10.30...10.60

Note remarks

Test sheet

: MB

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 646 958

Injection numb

Pump designation : PE6P120A320LS7836-10

EP type number

: 0 412 626 854

Governor

Governor design.

: RQV300...950PA797-33

Governer no.

: 0 421 813 958

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

: 180.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Openina .

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, par: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rpm: 600

Rack travel in mm : 11.70...11.90

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

Spread

rpm : 300.0

Rack travel in mm: 5.3...5.9

Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300

travel mm 2nd speed

: 1.00...1.50

travel mm

rpm : 780

3rd speed

: 6.10...6.60 rpm : 1008

travel mm

: 8.30...8.80

4th speed

rpm : 1092

travel mm

: 11.00...10.30

5th speed travel mm

: 1190 rpm

: 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 700 Del.quantity : 164.0...169.0) cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 114...122 Testina: 1st rack travel in: 11.50 Speed rpm : 990...1000 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 : 0.00...1.00 Speed mom LOW IDLE 1 Control Lever position degrees: 78...86 Testing: speed rpm : 200 Minimum rack trave: 7.40 Speed Speed : 300 rpm Rack travel in mm : 5.50...5.70 CONSTANT REGULATION Speed rpm : 300...450 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom Pressure hPa : 700 Rack travel mm : 11.70...11.90 Measurement 1/min: 600 Speed 1st pressure hPa : 180 Rack travel in m: 10.40...10.60 2nd pressure hPa : 280 Rack travel in m: 11.30...11.50 3rd pressure hPa : 900 Rack travel in m: 11.80,..12.00 \* 4th pressure hPa : 1100 Rack travel in m: 12.20...12.40 5th pressure hPa : -Rack travel in m: 10.30...10.60

1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed rpm : 950 Del.quantity cm3/: 187.0...190.0 1000 s: (184.0...193.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1400 : 800 Speed rpm Del.quantity cm3/ : 189.0...193.0 1000 s: (186.0...196.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than

full load rack tr: 11.50 Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100 bel.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

START CUT-OUT

Note remarks

Test sheet

: MB

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 959

Injection pump

Pump designation: PE6P12OA32OLS7836-10

EP type number

: 0 412 626 854

Governor

Governor design. : RQ300/1050PA993-6

Governer no.

: 0 421 801 616

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

Rated speed

: 200.0

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

Spread

cm3 : 0.6 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 600

Aneroid pressure h: 800

Del.quantity

: 182.0...184.0

1000 : (179.0...187.0)

Spread

: 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 rpm

Rack travel in mm : 20.0

Testing: 1st rack travel in: 12.10 Speed החכרו : 1090...1105 2nd rack travel in: 4.00 Speed וחכרו : 1175...1205 4th rack travel in: 1300 Speed rom : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 5.6 Testing: Speed rpm : 200 Minimum rack trave: 7.50 : 300 Speed rpn Rack travel in mm : 5.50...5.70 Rack travel in mm : 2.00 Speed rom : 380...420 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 800 Pressure : 12.40...12.60 Rack travel mm Measurement Speed 1/min : 600 1st pressure hPa : 250 Rack travel in m: 10.90...11.10 2nd pressure hPa : 400 Rack travel in m: 11.80...12.00 3rd pressure hPa : 1000 Rack travel in m: 12.60...12.80 4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : -Rack travel in m: 10.30...10.60 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 : 1050 Speed rpm Del.quantity cm3/: 201.0...204.0 1000 s: (198.0...207.0) Spread cm3 : 8.00 1000 s: (12.0)

Aneroid pressure h: 1400 : 800 rpm Del.quantity cm3/: 202.0...206.0 1000 s: (199.0...209.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.10 rpm : 1090...1105 Speed

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

:

Remarks:

STARTING FUEL DELIVERY

Note remarks

Test sheet : MB 9,6 q 8 Edition : 26.06.92 Replaces : 01.92

Test oil : ISO-4113

Combination no. : 0 402 646 960

Injection pump

Fump designation : PE6P12DA320LS7836-10

EP type number : 0 412 626 854

Governor

Governor design. : RQ300/950PA993-7 Governer no. : D 421 801 617

Customer-spec, information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version KW : 200.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina .

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + -- ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.3...5.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 800

Del.quantity

: 182.0...184.0 1000 : (179.0...187.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 20.0

Testina: 1st rack travel in: 12.10 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rom : 1065...1095 Speed 4th rack travel in: 1200 Speed rom : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.6 Testina: : 200 Speed rom Minimum rack trave: 7.40 Speed rpm : 300 Rack travel in mm : 5.50...5.70 Rack travel in mm: 2.00 : 370...410 Speed rom Ameroid/Altitude Compensator Test 1st version Settina Speed : 600 המיז Pressure hPa : 800 : 12.40...12.60 Rack travel mm Measurement 1/min : 600Speed 1st pressure hPa : 250 Rack travel in m: 10.90...11.10 2nd pressure hPa : 400 Rack travel in m: 11.80...12.00 3rd pressure hPa : 1000 Rack travel in m: 12.60...12.80 4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : -Rack travel in m: 10.30...10.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400

Speed rpm : 950 Del.quantity cm3/ : 203.0...206.0

cm3 : 8.00

1000 s: (12.0)

1000 s: (200.0...209.0)

Aneroid pressure h: 1400
Speed rpm : 800
Del.quantity cm3/ : 202.0...206.0
1000 s: (199.0...209.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 12.10 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : PEN 16,2 b3 Edition : 31.07.92 : 01.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 646 967 Injection pump Pump designation : PE6P130A720RS7150 EP type number : 0 412 636 808 Governor Governor design. : RQV250...900PA881-1 : 0 421 813 982 Governer no. Customer-spec. information Customer : PENTA Engine : TAMD 162 A TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 922 198 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 3.60...3.70 Prestroke mm : (3.55...3.75) Rack travel in mm : 9.00...12.00 E25

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - \* : 0.30 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 11.50...11.60 Del.quantity cm3/: 33.4...33.7 100 s: (33,1...34.1) Spread cm3 : 0.6100 s: (1.0) 2nd speed rpm : 250.0Rack travel in mm: 4.1...4.3 Del.quantity cm3/: 1.7...2.2 100 s: (1.4...2.4) cm3 : 0.5 Spread 100 s: (0.8) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 travel mm : 0.90...1.30 2nd speed rpm : 350 travel mm : 2.00...2.60 3rd speed rpm : 700 : 4.50...5.10 travel mm rpm : 925 4th speed : 7.60...7.80 travel mm 5th speed rpm : 985 travel mm : 8.40...8.80 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 980 Speed Rack travel in mm: 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rom : 700 Aneroid pressure h: 1000 Del.quantity : 334.5...341.0)

Spread

cm3 : 6.00

1000 : (10.00)

RATED SPEED

1st version

Control lever

position degrees: 114...122

Testing:

1st rack travel in: 10.50

Speed rpm : 925...935 2nd rack travel in: 4.00

Speed rpm : 985...1015 4th rack travel in: 1100

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 63...71

Testing:

Speed rpm : 100

Minimum rack trave: 5.70 rpm : 250

Rack travel in mm : 4.10...4.30

CONSTANT REGULATION

Speed rcm : 250...350

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 1000

Rack travel mm : 11.50...11.60

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 665

Rack travel in m: 11.20...11.30

3rd pressure hPa : 350

Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 226.5...229.5

1000 s: (223.0...233.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50

Speed

rpm : 925...935

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.10...4.30

Del.quaritity cm3/: 17.0...22.0 1000 s: (14.5...24.5)

Spread cm3 : 5.00

1000 s: (8.00)

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 3.0...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 14.00...15.00 Firing order : 1-5-3-6-2-4 Note remarks : DAF Test sheet : 26.06.92 Edition : 03.92 Penlaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 970 Tolerance + - \* : 0.50 (0.75) Injection pump BEGINNING OF DELIVERY DIFFERENCE Fump designation : PE6P120A320RS7248Y EP type number : 0 412 626 863 betw. rack trav. m: 4.90...5.10 & maximum rack tra: 10.2...11.2 Governor Governor design. : RQV275...1150PA986 Difference ° CS : 2.25...3.75 : 0 421 813 920 Governer no. BASIC SETTING Customer-spec. information Customer : DAF rom: 1000 1st speed : RS 180 L Rack travel in mm : 10.70...10.80 Engine TEST BENCH REQUIREMENTS Del.quantity cm3/: 14.5...14.7 Test oil 100 s: (14.2...15.0) inlet temp. °C : 38...42 Spread cm3 : 0.5Cverflow valve : 1 419 992 198 100 s: (0.9) Inlet press., bar: 1.50 2nd speed rpm : 275.0 Rack travel in mm : 5.3...5.5 Del.quartity cm3/ : 1.3...1.9 Overflow 100 s: (1.0...2.2) quantity min. 1/h: 120...140 cm3 : 0.8 Spread Test nozzle holder 100 s: (1.2) : 1 688 901 105 assembly (B) Setting of injection pump Opening with governor : 207...210 pressure, bar GUIDE SLEEVE TRAVEL Orifice plate rpm : 275 1st speed diameter mm : 0,8 : 1.20...1.60 travel mm : 315 2nd speed rpm : 1.80...2.20 travel mm Test lines : 1 680 750 089 : 1205 3rd speed man travel mm : 8.10...8.50 Outside diameter : 1340 4th speed rpm x Wall thickness travel mm : 9.70...9.90 x Length mm : 8.00X2.50X600 GUIDE SLEEVE POSITION (A) Injection pump setting values Control-lever position Insp. values in parentheses Degree: -1 rpm : 1330 Set equal delivery quant. Speed per values Rack travel in mm : 9.40...12.00 BEGINNING OF DELIVERY FULL LOAD DELIV. AT FULL LOAD STOP Test pressure, bar: 25...27

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity

: 145.5...147.5 1000 : (142.5...150.5)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 9.70

rpm : 1180...1190 Speed

2nd rack travel in: 4.00

rpm : 1265...1295

4th rack travel in: 1450

Speed rpm : 0.00...1.40

LOW IDLE 1 Control Lever

position degrees: 79...87

Testing:

Speed rpm : 175 Minimum rack trave: 6.20 rpm : 275 Speed

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 315...365

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed COM Pressure hPa : 1000

Rack travel mm : 10.70...10.80

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60 2nd pressure hPa : 260 Rack travel in m: 10.30...10.40

3rd pressure hPa : 190

Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm2/: 119.0...121.0 1000 s: (116.0...124.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.70

rpm : 1180...1190 Speed

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

E28

Note remarks

Test sheet

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 977

Injection pump

Pump designation : PE6P12OA32OLS7846

EP type number

: 0 412 626 865

Governor

Governor design. : RQ300/1050PA1030-1

Governer no.

: 0 421 801 641

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

: 230.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 12.90...13.10

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 4.9...5.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 700

Aneroid pressure h: 1000

Del.quantity : 229.0...234.0)

Spread

: 5.00

cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm

: 600

Speed Rack travel in mm : 20.0

F01

Testing: 1st rack travel in: 11.60 rpm : 1090...1105 Speed 2rd rack travel in: 4.00 4th rack travel in: 1300 Speed rem LOW IDLE 1 Setting point w/out bumper spring : 300 rom Rack travel in mm: 5.2 Testina: Speed rpm : 200 Minimum rack trave: 7.50 Speed : 300 man Rack travel in mm : 4.90...5.50 Rack travel in mm: 2.00 Speed rpm : 360...400 TORQUE CONTROL Dimension a mm : 0.35 Torque control curve - 1st version rpm : 1050 1st speed Rack travel in m: 12.60...12.80 2nd speed rpm : 700 Rack travel in m: 13.30...13.50 Ameroid/Altitude Compensator Test 1st version Setting Speed : 500 man Pressure hPa : -Rack travel mm : 9.60...9.90 Measurement Speed 1/min: 500 1st pressure hPa : 300 Rack travel in m: 10.10...10.30 2nd pressure hPa : 700 Rack travel in m: 12.00...12.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 : 1050 Speed rpm Del.quantity cm3/: 216.0...220.0 1000 s: (213.0...223.0) cm3 : 8.00 Spread 1000 s: (12.0)

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.00 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 11.60 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 10.80...11.00

Remarks:

F02

Speed

Aneroid pressure h: -

rpm

: 500

Note remarks

Test sheet

: MB

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no.

: C 402 646 979

Injection pump

Pump designation: PE6P120A320LS7846

EP type number

: 0 412 626 865

Governor

Governor design. : RQ300/950PA1032

Governer no.

: 0 421 801 644

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

: 230.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Over-flow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000

x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

Spread

Spread

rpm: 700

Rack travel in mm: 12.90...13.10

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 700

Aneroid pressure h: 1000 Del.quantity

: 229.0...231.0

1000 : (226.0...234.0)

Spread

Speed

: 5.00 cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm

: 600

Rack travel in mm : 20.0

Testing: 1st rack travel in: 11.90 Speed rpm : 990...1005 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1300 Speed rom : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.2 Testina: Speed rpm : 200 Minimum rack trave: 7.50 rpm : 300 Speed Rack travel in mm : 4.90...5.50 Rack travel in mm: 2.00 Speed rpm : 360...400 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : -Rack travel mm : 9.60...9.90 Measurement Speed  $1/\min : 500$ 1st pressure hPa : 300 Rack travel in m: 10.10...10.30 2nd pressure hPa : 700 Rack travel in m: 12.00...12.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 950 Del.quantity cm3/; 226.0...230.0 1000 s: (223.0...233.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.00 1000 s: (12.0)

1st version 1mm rack travel less than

full load rack tr: 11.90 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 9.60...10.10

Remarks:

BREAKAWAY

Note remarks

Test sheet

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 980

Injection pump

Pump designation: PE6P120A320LS7846

EP type number : 0 412 626 865

Covernor

Governor design. : RQV300...950PA1033

Governer no. : 0 421 813 990

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW : 230.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Openina

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Firing order

Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 12.90...13.10

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.10...1.50 travel mm

2nd speed

rpm : 567

travel mm 3rd speed

: 4.40...5.00 rpm : 780

travel mm

: 6.00...6.60

4th speed

rpm : 1010 : 8.50...8.704

travel mm 5th speed

Speed

rpm : 1190

travel mm

: 11.00...12.00

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 1066

Rack travel in mm : 10.60...13.20

FULL LOAD DELIV. AT FULL LOAD STOP

F05

1st version Speed Del.quantity

rpm : 700 Aneroid pressure h: 1000

: 229.0...231.0

1000 : (226.0...234.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 11.90 rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1065...1095 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1 Control Lever

position degrees: 76...84

Testing:

Speed rpm Minimum rack trave: 7.50 Speed nom : 300

Rack travel in mm : 4.90...5.50

CONSTANT REGULATION

Speed : 300...400 rpm

Aneroid/Altitude Compensator Test

1st version Settina

: 500 Speed rpm hPa : -Pressure

Rack travel mm : 9.60...9.90

Measurement

1/min: 500 Speed

1st pressure hPa : 300

Rack travel in m: 10.10...10.30

2nd pressure hPa : 700

Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 Speed

rpm : 950 Del.quantity cm3/: 225.0...230.0

1000 s: (223.0...233.0)

Spread cm3 : 8.00

1000 s: (12.0) Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

cm3 : 8.00 Spread

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 990...1000

Remarks:

F06

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : UNI Edition : 21.05.92 : 03.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 646 981 Injection pump Pump designation : PE6P130A720RS7225 EP type number : 0 412 636 817 Governor Governor design. : RQV300...900PA946-1 Governer no. : 0 421 813 992 Customer-spec. information Customer : IVECO-UNIC : 8210.42.061 Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm: 11.50...12.50

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 12.60...12.70 Del.quantity cm3/: 27.0...27.3 100 s: (26.6...27.6) cm3 : 0.6Spread 100 s: (1.0) 2nd speed rpm : 300.0 Rack travel in mm: 4.4...4.8 Del.quantity cm3/: 1.9...2.5 100 s: (1.5...2.9) cm3 : 1.0 Spread 100 s: (1.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 945 1st speed : 7.70...7.90 travel mm 2nd speed rpm : 300 travel mm : 1.00...1.40 3rd speed rpm : 550 : 3.40...4.00 rpm : 750 travel mm 4th speed travel mm : 5.60...6.00 5th speed rpm : 1250 : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1090 Speed Rack travel in mm : 10.30...12.90 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Aneroid pressure h: 900 Del.quantity : 270.0...276.5)

Spread

cm3 : 6.00

1000 : (10.00)

RATED SPEED

1st version

Control Lever

position degrees: 116...124

Testing:

1st rack travel in: 11.60

rpm : 940...950 Speed

2nd rack travel in: 4.00

rpm : 1025...1055 Speed

4th rack travel in: 1200

Speed rom : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 75...83

Testing:

Speed rpm : 100

Minimum rack trave: 6.10

rpm : 300

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 350...480

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 900

: 12.60...12.70 Rack travel mm

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.20...10.40

2nd pressure hPa : 350

Rack travel in m: 12.00...12.10

3rd pressure hPa : 300

Rack travel in m: 11.00...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 500

Del.quantity cm3/: 285.0...292.0 1000 s: (281.5...295.5)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 202.0...205.0 1000 s: (198.5...208.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 940...950

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.40...4.80 Del.quantity cm3/: 19.0...25.0

1000 s: (15.0...29.0)

cm3 : 10.00Spread

1000 s: (14.00)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.50...4.60 : (4.45...4.65) Note remarks Rack travel in mm : 9.00...12.00 : 1-6- 3- 5- 2- 4 Firing order Test sheet : LIE Edition : 31.07.92 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 982 Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation: PE6P120A320LS7848 EP type number : 0 412 626 866 1st speed rpm: 1050 Governor Governor design. : RQV300...1050PA1034 Rack travel in mm : 14.90...15.00 : 0 421 813 993 Governer no. Del.quantity cm3/: 25.9...26.1 Customer-spec. information Customer : LIEBHERR 100 s: (25.6...26.4) : D 9306 TI Engine cm3 : 0.5Spread 1st version kW : 270.0 100 s: (0.9) : 2100 Rated speed 2nd speed rpm : 350.0TEST BENCH REQUIREMENTS Rack travel in mm: 5.5...5.9 Del.quantity cm3/: 3.0...3.6 Test oil 100 s: (2.7...3.9) inlet temp. °C : 38...42 cm3 : 0.6 Spread 100 s: (1.0) Overflow valve : 1 417 413 025 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 350assembly : 1 688 901 105 travel mm : 1.70...2.10 2nd speed : 405 rpm Openina travel mm 2.40...2.90 pressure, bar : 207...210 : 550 3rd speed rpm : 4.20...4.60 travel mm Orifice plate : 780 4th speed rpm diameter mm : 0,8 : 6.30...6.90 travel mm 5th speed : 1118 rpm travel mm : 10.40...10.60 Test lines : 1 680 750 075 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 rpm : 1185 x Length mm : 8.00x2.50x1000 Speed Rack travel in mm : 12.60...15.20 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values \_\_\_\_ 1st version Speed rpm : 1050BEGINNING OF DELIVERY Aneroid pressure h: 1500 Del.quantity : <2>9.0...264.0) Test pressure, bar: 25...27

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 103...111

Testina:

1st rack travel in: 13.90 rpm : 1100...1110 Speed 2nd rack travel in: 4.00

Speed rpm : 1200...1230 4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 68...75

Testing:

rpm : 250 Speed Minimum rack trave: 8.90 Speed rpm : 350
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00

Speed rpm : 430...490

CONSTANT REGULATION

rpin : 350...420 Spead

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 700 Pressure hPa : 1500

Rack travel mm : 14.90...15.00

Measurement

1/min: 700 Speed 2nd pressure hPa : 950

Rack travel in m: 14.60...14.70 3rd pressure hPa : 750

Rack travel in m: 13.00...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 700 Del.quantity cm3/: 194.0...196.0

1000 s: (191.0...199.0)

Spread cm3 : 8.001000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.90

Speed rpm : 1100...1110

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 150.0...170.0 1000 s: (146.0...174.0)

•

Remarks:

F10

Note remarks

Test sheet

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 983

Injection pump

Pump designation: PE6P120A320LS7846

EP type number

: 0 412 626 865

Governor

Governor design.

: RQV300...1050PA1033-

Governer no.

: 0 421 813 994

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

: 230.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

**Opening** 

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 12.90...13.10

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 travel mm

: 0.60...1.00

2nd speed 575 rpm :

4.20...4.80 travel mm

3rd speed : 830 rpm

: 5.80...6.40 travel mm : 1107

4th speed

Speed

rpm

travel mm

: 8.30...8.50 : 1290

5th speed rpm

travel mm

: 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: 108

rpm : 1160

Rack travel in mm : 10.40...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1000

Aneroid F. Del.quantity 1000 : 229.0...231.0 : (226.0...234.0)

cm3 Spread : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 11.60

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1155...1185 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1 Control lever

position degrees: 76...84

Testing:

Speed rpm : 200 Minimum rack trave: 7.50 Speed rbm .

Rack travel in mm : 4.90...5.50

CONSTANT REGULATION

Speed rpm : 300...400

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.60...12.80

2nd speed rpm : 850

Rack travel in m: 12.90...13.10

Aneroid/Altitude Compensator Test

1st version Setting

rpm : 500 Speed Pressure hPa : -

: 9.60...9.90 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : 300 Rack travel in m: 10.10...10.30

2nd pressure hPa : 700

Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm : 1050 Speed

Del.quantity cm3/: 216.0...220.0 1000 s: (213.0...223.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1090...1100

Remarks:

Note remarks

Test sheet ; DAF

Edition : 26.06.92 Replaces : 03.92

Test oil : ISO-4113

Combination no. : 0 402 646 984

Injection pump

Pump designation : PE6P120A320RS7248

EP type number : 0 412 626 861

Governor

Governor design. : RQ275/1150PA987 Governer no. : 0 421 801 578

Customer-spec, information Customer : DAF

Engine : RS 222 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

**Openina** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 14.00...15.00

Firing order : 1-5- 3- 6- 2- 4

Phasina : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 11.7...12.7

Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 18.4...18.6

100 s: (18.1...18.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0 Rack travel in mm: 5.3...5.5

Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2) Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 550 Speed

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

Del.quantity : 184.0...186.0 1000 : (181.0...189.0)

cm3 : 5.00

1000 : (9.00)

RATED SPEED

Spread

1st version

Setting point:

Speed rpm : 550 Rack travel in mm : 15.8

F13

Testing:

1st rack travel in: 11.20

Speed rpm : 1175...1190

2nd rack travel in: 4.00

Speed rpm : 1255...1285 4th rack travel in: 1450

rpm : 0.00...1.40Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275 Rack travel in mm: 4.7

Testina:

Speed rpm : 100 Minimum rack trave: 6.20 rpm : 275 Speed

Rack travel in mm : 4.60...4.80

Rack travel in mm : 2.00

rpm : 320...360 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rom Pressure hPa : 1000

: 12.20...12.30 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.50

2nd pressure hPa : 420

Rack travel in m: 11.60...11.70

3rd pressure hPa : 240

Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/: 120.0...122.0 1000 s: (117.0...125.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.20 Speed rpm : 1175...1190 Speed

F14

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

: DAF

Edition

: 26.06.92

Replaces

: 03.92

Test oil

: ISO-4113

Combination no.

: 0 402 646 985

Injection pump

Pump designation : PE6P120A320RS7248Z

EP type number

: 0 412 626 862

Governor

Governor design. : RQ275/1150PA987

Governer no.

: 0 421 801 578

Customer-spec, information Customer

: DAF

Engine

: RS 200 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

: 8.00x2.50x600

x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 14.00...15.00

F15

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10

& maximum rack tra: 10.8...11.8

Difference \* CS : 2.25...3.75

BASIC SETTING

1st speed

rpm: 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 16.4...16.6

100 s: (16.1...16.9)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 275.0

Rack travel in mm: 5.3...5.5

Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2)

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000

Aneroid pressure h: 1000 Del.quantity

: 164.0...166.0 1000 : (161.0...169.0)

Spread

: 5.00

cm3 1000 : (9.00)

RATED SPEED

1st version

Speed

Setting point:

: 550

rpm

Rack travel in mm: 15.8

Testing:

1st rack travel in: 10.30

rpm : 1175...1190 Spead

2nd rack travel in: 4.00

Speed rpm : 1245...1275 4th rack travel in: 1450

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 4.7

Testing:

rpm : 100 Speed

Minimum rack trave: 6.20

rpm : 275 Speed

Rack travel in mm: 4.60...4.80
Rack travel in mm: 2.00
Speed rpm: 320...360

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 600 rpm

Pressure hPa : 1000

: 11.30...11.40 Rack travel mm

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 340

Rack travel in m: 10.70...10.80

3rd pressure hPa : 200

Rack travel in m: 9.60...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 115.0...117.0

1000 s: (112.0...120.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.30

rpm : 1175...1190 Speed

LOW IDLE

: 275 Speed LDW.

Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

F16

Note remarks

Test sheet

: DAF

Edition

: 26.06.92

Replaces

: 03.92

Test oil

: ISO-4113

Combination no.

: 0 402 646 986

Injection pump

Pump designation : PE6P120A320RS7248Y

EP type number

: 0 412 625 863

Governor

Governor design. : RQ275/1150PA987

Governer no.

: 0 421 801 578

Customer

Customer-spec. information

: DAF

Engine

: RS 180 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter nam

: 0,8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 14.00...15.00

F17

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...0501

& maximum rack tra: 10.2...11.2

Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed

rpm: 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 14.5...14.7

100 s: (14.2...15.0)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 275.0

Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2) cm3 : 0.8

Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 550

Rack travel in mm: 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Del.quantity

Speed

Spread

rpm : 1000

Aneroid pressure h: 1000

: 145.5...147.5

1000 : (142.5...150.5)

cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Speed

Setting point:

nom

Rack travel in mm: 15.8

Testina:

1st rack travel in: 9.70

rpm : 1175...1190 Speed

2nd rack travel in: 4.00

Speed rpm : 1245...1275

4th rack travel in: 1450

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 4.7

Testina:

Speed rpm : 175

Minimum rack trave: 7.00

Speed rpm : 275

Rack travel in mm : 4.60...4.80

Rack travel in mm : 2.00

Speed rpm : 320...360

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm

Pressure hPa : 1000

: 10.70...10.80 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 260

Rack travel in m: 10.30...10.40

3rd pressure hPa : 190

Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.70

rpm 1: 1175...1190 Speed

F18

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

: DAF

Edition

: 31.07.92

Replaces

: 02.92

Test oil

: TS0-4113

Combination no. : 0 402 646 988

Injection pump

Pump designation : PE6P120A320RS7230X

EP type number

: D 412 626 868

Governor

Governor design. : RQV250...1000PA990K

Governer no. : 0 421 815 274,

Customer

Customer-spec. information : DAF

Engine

: WS 295 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Openina

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0.8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

F19

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 980

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 25.8...26.0

100 s: (25.5...26.3)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 5.8...6.2 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 250

travel mm

: 1.30...1.70

2nd speed

rpm : 285

travel mm

: 2.10...2.50

3rd speed

rpm : 685

travel mm 4th speed

: 6.20...6.60 rpm : 1030

travel mm

: 9.60...10.00 rpm : 1145

5th speed travel mm

: 11.20...11.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 980

Aneroid pressure h: 1500

Del.quantity : 250.0...263.0)

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever

position degrees: 116...124

Testina:

1st rack travel in: 12.90 rpm : 1030...1040 Speed 2nd rack travel in: 4.00

rpm : 1135...1165 Speed 4th rack travel in: 1275

rom : 0.00...1.40Speed

LOW IDLE 1 Control Lever

position degrees: 66...74

Testing:

Speed rpm : 150 Minimum rack trave: 7.00 rpm : 250 Speed

Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00

Speed rpm : 320...380

TURQUE CONTROL Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 400

Rack travel in m: 12.10...12.30

2nd speed rpm : 600

Rack travel in m: 12.30...12.40

3rd speed rpm : 825

Rack travel in m: 13.30...13.50

rpm : 980 4th speed

Rack travel in m: 14.20...14.40

Aneroid/Altitude Compensator Test

1st version Setting

Speed rom : 980 hPa : 1500 Pressure

Rack travel mm : 13.90...14.00

Measurement

Speed 1/min: 980

1st pressure hPa : -

Rack travel in m: 8.70...8.90

2nd pressure hPa : 830

Rack travel in m: 12.60...12.70 3rd pressure hPa : 420

Rack travel in m: 9.70...9.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 600 Del.quantity cm3/ : 255.0...259.0 1000 s: (252.0...262.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 159.0...161.0

1000 s: (156.0...164.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.90

rpm • 1030...1040 Speed

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: DAF Test sheet Edition : 30.04.92

Replaces : 02.92 Test oil : I30 4113

Combination no. : 0 402 646 989

Injection pump

Pump designation : PE6P120A320RS7230Y

EP type number : 0 412 626 867

Governor

Governor design. : RQV250...1000PA990K

Governer no. : 0 421 815 274

customer-spec, information Customer : DAF

Engine : WS 315 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test lines : 1 689 750 089

Outside diameter x Wall thickness

: 8.00x2.50x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \cdot : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 980

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 27.3...27.5

100 s: (27.0...27.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 250.0Rack travel in mm: 5.8...6.2

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

travel mm : 1.30...1.70

2nd speed rpm : 285

: 2.10...2.50 travel mm

3rd speed rpm : 685

: 6.20...6.60 travel mm

4th speed rpm : 1030

: 9.60...10.00 travel mm

rpm : 1145 5th speed

travel mm : 11.20...11.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1130

Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980 Aneroid pressure h: 1500

Del.quantity : 273.0...275.0 1000 : (270.0...278.0)

cm3 Spread

: 5.00 1000 : (9.00)

## RATED SPEED

1st version Control Lever

acsition degrees: 116 ... 124

Testing:

1st rack travel in: 13.50

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

: 1135...1165 Speed nom

4th rack travel in: 1275

Speed rom : 0.00...1.40

LOW IDLE 1

Control Lever

position degrees: 66...74

Testing:

Speed : 150 rom Minimum rack trave: 7.00 : 250 rpm

Rack travel in mm : 5.10...5.30

Rack travel in mm: 2.00 Speed rom : 320...360

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 400

Rack travel in m: 12.90...13.10

rpm : 600 2nd speed

Rack travel in m: 13.10...13.30

3rd speed rpm : 800

Rack travel in m: 14.00...14.20

rpm : 980 4th speed

Rack travel in m: 14,80...15.00

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 980 rpm hPa : 1500 Pressure

: 14.50...14.60 Rack travel mm

Measurement

1/min: 980 Speed

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 760 Rack travel in m: 13.10...13.20

3rd pressure hPa : 350

Rack travel in m: 10.20...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

: 600 Speed rpm

Del.quantity cm3/: 281.0...285.0 1000 s: (278.0...288.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 168.0...170.0

1000 s: (165.0...173.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.50

rpm : 1030...1040 Speed

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : UNI Edition : 21.05.92 Replaces : 04.92 Test oil : iso-4113

Combination no. : 0 402 646 990

Injection pump

Pump designation : PE6P130A720RS7225 EP type number : 0 412 636 817

Governor

Governor design. : RQV300...950PA975-2K

Governer no. : 0 421 815 310

Customer-spec, information Customer : IVECO-UNIC

Engine : 8210, 42, 369

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 11.50...12.50

Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 950 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 25.2...25.4

100 s: (24.9...25.7)

Spread cm3 : 0.5

100 s: (0.8)

rpm : 300.0 2nd speed

Rack travel in mm: 4.1...4.5 Del.quantity cm3/: 1.9...2.5

100 s: (1.5...2.9)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed travel mm : 8.40...8.60

2nd speed : 300 rpm

travel mm : 1.00...1.40

3rd speed rom : 500

travel mm : 3.30...3.90

4th speed rpm : 700

: 5.40...5.80 travel mm

5th speed rpm : 1400

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1175 Speed

Rack travel in mm : 9.70...12.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950 Aneroid pressure h: 1000

Del.quantity : 202.0...257.0)

Spread cm3 : 5.001000 : (8.00) RATED SPEED 1st version Control Lever position degrees: 112...120 Testina: 1st rack travel in: 10.90 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1080...1110 Speed 4th rack travel in: 1200 rom : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 61...69 Testing: Speed : 100 rpm Mirrimum rack trave: 5.80 Speed rpm : 300 Rack travel in mm : 4.20...4.40 CONSTANT REGULATION rpm : 340...460 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 950 1st speed Rack travel in m: 11.90...12.00 rpm : 350 2nd speed Rack travel in m: 11.30...11.50 3rd speed rpm : 700 Rack travel in m: 11.90...12.00 4th speed rpm : 550 Rack travel in m: 11.70...11.90 Aneroid/Altitude Compensator Test 1st version Setting Speed : 950 rpm hPa : 1000 Pressure

Rack travel mm : 11.90...12.00

Rack travel in m: 10.00...10.20 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 700 Del.quantity cm3/ : 259.0...265.0 1000 s: (256.0...268.0) Aneroid pressure h: 1000 Speed rpm : 550 Del.quantity cm3/ : 261.0...267.0 1000 s: (258.0...270.0) Aneroid pressure h: rpm : 550 Speed Del.quantity cm3/: 186.0...188.0 1000 s: (183.0...191.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.90 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...170.0 1000 s: (126.0...174.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.10...4.50 Del.quantity cm3/: 19.0...25.0 1000 s: (15.0...29.0) Spread cm3 : 8.001000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Measurement

1st pressure hPa : -

2nd pressure hPa : 600

3rd pressure hPa : 500

Speed

1/min: 950

Rack travel in m: 9.50...9.70

Rack travel in m: 10.80...10.90

Note remarks

Test sheet : DAF

Edition : 03.07.92 Replaces : 03.92

Test vil : ISO-4113

Combination no. : 0 402 646 991

Injection pump

Pump designation : PE6P120A320RS7218Y

EP type number : 0 412 626 859

Governor

Governor design. : RQV275...1000PA939-2

: 0 421 813 986 Governer no:

Customer-spec. information

Customer : DAF

Engine : WS 222 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.30...5.40 Prestroke mm

: (5.25...5.45)

Rack travel in mm : 14.00...15.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 13.2...14.2

Difference \* CS : 2.25...3.75

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 19.5...19.7

100 s: (19.2...20.0)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 275.0 2nd speed

Rack travel in mm : 6.2...6.6 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

Spread

1st speed rpm : 1045

travel mm : 7.70...8.20

2nd speed rpm : 275

travel mm : 1.10...1.60

3rd speed rpm : 380

travel mm : 2.40...2.90

4th speed : 675 rpm

travel mm

: 4.20...4.70

5th speed rpm : 1310

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1150 Speed

Rack travel in mm : 11.40...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rom : 850Aneroid pressure h: 1000 Del.quantity : 195.0...197.0 1000 : (192.0...200.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 115...123 Testina: 1st rack travel in: 12.70 Speed rpm : 1040...1050 2nd rack travel in: 4.00 Speed rpm : 1145...1175 4th rack travel in: 1250 Speed rpm : 0.00...1.40 LOW IDLE 1 Control Lever position degrees: 78...86 Testina: Speed : 100 rbm Minimum rack trave: 6.50 : 275 Speed rpm Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rom : 300...350 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom Pressure hPa : 1000 Rack travel mm : 13.70...13.80 Measurement Speed 1/min : 600 1st pressure hPa : -Rack travel in m: 11.50...11.70 2nd pressure hPa : 400 Rack travel in m: 13.20...13.30 3rd pressure hPa : 230 Rack travel in m: 12.00...12.20 FUEL DELIVERY CHARACTERISTICS

1000 s: (136.0...144.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.70 Speed rpm : 1040...1050 LOW IDLE Speed rpm : 275
Rack travel in mm : 4.90...5.10 Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

1st version

Aneroid pressure h: -

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 21.05.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 646 993 Injection pump Pump designation : PE6P120A320LS7852 EP type number : 0 412 626 871 Governor Governor design. : RQ300/1050PA1030-3 : 0 421 801 653 Governer no. Customer-spec. information Customer : MERCEDES-BENZ : 0M441 LA Engine : 250.0 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening 1 4 1 : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

: 5.20...5.30 Prestroke mm : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1 : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 600 Pack travel in mm : 14.00...14.20 Del.quantity cm3/: 23.4...23.6 100 s: (23.1...23.9) cm3 : 0.5 Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 5.6...6.2 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6Spread 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1000 : 234.0...236.0 Del.quantity 1000 : (231.0...239.0) cm3 : 5.00 Spread 1000 ; (9.00) RATED SPEED 1st version Setting point: Speed rpm : 600 Rack travel in mm : 20.0 Testing:

1st rack travel in: 12,90

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

rpm : 1095...1110 Speed 2nd rack travel in: 4.00 rom : 1175...1205 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 5.9 Testing: Speed rpm : 200 Minimum rack trave: 8.30 Speed rpm : 300 Rack travel in mm : 5.60...6.20 Rack travel in mm : 2.00 : 370...410 Speed r.bm TORQUE CONTROL 3rd speed rpm : 800 Rack travel in m. 14.00...14.20 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 man hPa : -Pressure Rack travel mm : 10.50...10.70 Measurement 1/min : 500Speed 1st pressure hPa : 300 Rack travel in m: 11.20...11.40 2nd pressure hPa : 700 Rack travel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1050
Del.quantity cm3/: 223.5...226.5
1000 s: (220.5...229.5)
Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Del.quantity cm3/: 60.0...90.0 1000 s: (56.0...94.0)

Rack travel in mm : 10.50...10.70

Remarks:

V9.

Note remarks

Test sheet

Edition : 22.05.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 994

Injection pump

Pump designation : PE6P120A320LS7852

EP type number : 0 412 626 871

Governor

Governor design. : RQ300/950PA1032-3

Governer no. : 0 421 801 654

Customer-spec, information

Customer : MERCEDES-BENZ

Engine : 0M441 LA

1st version kW : 250.0

: 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

rom : 300.02nd speed Rack travel in mm : 5.6...6.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1000

: 234.0...236.0 Del.quantity

1000 : (231.0...239.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version

Setting point:

rpm : 600

Rack travel in mm : 20.0

Testina:

1st rack travel in: 13.10

rpm : 990...1005 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.9 Testing: Speed rpm : 200 Minimum rack trave: 8.30 Speed rpm : 300
Rack travel in mm : 5.60...6.20
Rack travel in mm : 2.00
Speed rpm : 370...410 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 **CDW** hPa : -Pressure : 10.50...10.70 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 11.20...11.40 2nd pressure hPa : 700 Rack travel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 950 Del.quantity cm3/: 230.5...233.5 1000 s: (227.5...236.5) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than

full load rack tr: 13.10 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 10.50...10.70

Remarks:

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**GDS** 

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 03.07.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 646 996 Injection pump Pump designation : PE6P120A320LS7852 EP type number : 0 412 626 871 Governor Governor design. : RQ300/1050PA1031-4 : 0 421 801 656 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M441 LA 1st version kW : 250.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Openina pressure, bar : 207...210 Orifice plate : 0,8 diameter mm

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 5.20...5.30 Prestroke ma : (5.15...5.35) Rack travel in mm : 20.00...21.00 : 6-3-5-2-4-1 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 6 BASIC SETTING 1st speed rpm: 600 Rack travel in mm : 13.90...14.10 Del.quantity cm3/: 23.7...23.9 100 s: (23.4...24.2) Spread cm3 : 0.5100 s: (0.9) rpm : 300.8 2nd speed Rack travel in mm: 5.6...6.2 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6 Spread 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed

Speed rpm: 600 Aneroid pressure h: 1000

Del.quantity : 237.0...239.0 1000 : (234.0...242.0)

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing: 1st rack travel in: 13.00 nom : 1090...1105 Speed 2rd rack travel in: 4.00 rpm : 1165...1195 Speed 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.9 Testina: Speed rpm : 200 Minimum rack trave: 8.10 Speed rpm : 300 Rack travel in mm: 5.80...6.00 Rack travel in mm: 2.00 rpm : 380...420 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : 1000 Pressure Rack travel mm : 13.90...14.10 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.50...10.70 2nd pressure hPa : 275 Rack travel in m: 11.20...11.40 3rd pressure hPa : 580 Rack travel in m: 12.90...13.10 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1050 Del.quantity cm3/: 225.0...228.0 1000 s: (223.0...231.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 133.0...135.0 1000 s: (130.0...138.0) Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1090...1105

Remarks:

G04

Note remarks

Test sheet : MB

Edition : 03.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 997

Injection pump

Pump designation: PE6P12OA320LS7852

EP type number : 0 412 626 871

Governor

Governor design. : RQV300...950PA1033-5

Governer no. : 0 421 814 008

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kw : 250.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/ : 23.7...23.9

100 s: (23.4...24.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.6...6.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 3001st speed

1.00...1.50 travel mm

2nd speed : 575 rpm

: 4.20...4.70 travel mm

3rd speed rpm : 790

: 5.90...6.40 travel mm

4th speed rpm : 1010

: 8.00...8.50 travel mm

rpm : 1200 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1060

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 1000

: 237.0...239.0 1000 : (234.0...242.0) Del.quantity : 5.00 Spread cm3 1000 : (9.0C) RATED SPEED 1st version Control Lever position degrees: 116...124 Testina: 1st rack travel in: 13.00 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1200 rpm : 0.00...1.40 Speed LOW IDLE 1 Control lever position degrees: 80...88 Testing: Speed : 200 rpm Minimum rack trave: 8.10 : 300 Speed rpm Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00 Speed : 410...470 rom CONSTANT REGULATION rpm : 290...360 Speed Ameroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : 1000 Pressure Rack travel mm : 13.90...14.10 Measurement Speed  $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 10.50...10.70 2nd pressure hPa : 275 Rack travel in m: 11.20...11.40 3rd pressure hPa : 580 Rack travel in m: 12.90...13.10

1st version Aneroid pressure h: 1000 Speed rpm : 950 Del.quantity cm3/: 231.0...234.0 1000 s: (228.0...237.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: --Speed rpm : 500 Del.quantity cm3/: 133.0...135.0 1000 s: (130.0...138.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rpm : 990...1000 Remarks:

Speed

START CUT-OUT

1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

Note remarks

Test sheet

: 22,05,92 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 998

Injection pump

Pump designation : PE6P120A320LS7852

EP type number

: 0 412 626 871

Governor

Governor design. : RQV300...1050PA1033

Governer no. : 0 421 814 009

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM441 LA

: 250.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 23.7...23.9

100 s: (23.4...24.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.6...6.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 0.50...1.00 travel mm

2nd speed rpm

: 4.30...4.80 travel mm

3rd speed : 625 rpm

: 4.80...5.30 travel mm

4th speed : 830 rpm

travel mm 5.90...6.40

: 1190 5th speed rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1150 Speed

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rom : 600 Aneroid pressure h: 1000 Del.quantity : 237.0...239.0 1000 : (234.0...242.0) : 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 13.00 Speed rpm : 1090...1105

2nd rack travel in: 4.00

rpm : 1155...1185 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1 Control Lever

position degrees: 78...86

Testing:

Speed rpm : 200 Minimum rack trave: 8.70 rpm : 300

Rack travel in mm : 5.60...6.20 Rack travel in mm : 2.00

CONSTANT REGULATION

rpm : 575...625 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa

: 10.50...10.70 Rack travel mm

Measurement

1/min : 500 Speed

1st pressure hPa : 275

Rack travel in m: 11.20...11.40

2nd pressure hPa : 580

Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

608

1st version

Anaroid pressure h: 1000

Speed rpm : 1050 Del.quantity cm3/ : 225.0...228.0 1000 s: (222.0...231.0)

Spread cm3 : 8.00 1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 133.0...135.0

1000 s: (130.0...138.0)

Spread cm3 : 8.001000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1090...1105

Remarks:

Note remarks

Test sheet

Edition : 30.04.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 817

Injection pump

Pump designation: PE8P120A320LS7801-10

EP type number : 0 412 628 851

Governor

Governor design. : RQ300/1050PA762-16

Governer no. : 0 421 801 620

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 260.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 : 8-7-2-6-3-5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm: 6.0...6.4

Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.5

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500 Aneroid pressure h: 1050

Del.quantity : 204.0...209.0)

: 4.00 cm3 Spread

1000 : (7.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.70 Speed rpm : 1095...1110 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 6.2 Testing: Speed : 200 rom Minimum rack trave: 8.00 rom : 300 Rack travel in mm : 6.00...6.40 Rack travel in mm: 2.00 : 380...420 Speed COM TORQUE CONTROL Dimension a mm : 0.75 nd speed rpm : 1050 Rack travel in m: 12.70...12.90 2nd speed rpm : 500 3rd speed Rack travel in m: 14.00...14.20 Anaroid/Altitude Compensator Test 1st version Setting : 600 Speed **MCD** Pressure hPa: -: 11.40...11.70 Rack travel mm Measurement Speed 1/min: 600 1st pressure hPa : 300 Rack travel in m: 12.30...12.50 2nd pressure hPa : 400 Rack travel in m: 13.30...13.60 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1050 : 1050 rpm Del.quantity cm3/: 178.0...181.0 1000 s: (175.0...184.0)

Spread cm3: 7.00 1000 s: (10.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) Spread cm3: 7.00 1000 s: (10.0)

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.70 Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 175.0...190.0 1000 s: (171.0...194.0)

Remarks:

G10

Note remarks

Test sheet

Edition : 30.04.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 825

Injection pump

Pump designation : PE8P120A320LS7801-10

EP type number : 0 412 628 851

Governor

: RQV300...1050PA797 Governor design.

-34

: 0 421 813 973 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M442 A Engine

1st version kW : 250.C Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Irilet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35) Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

4-1

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 14.00...14.20

Del.quantity cm3/: 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0Rack travel in mm: 6.0...6.4 Del.quantity cm3/: 1.3...1.9

100 s: (1.0...2.2)

cm3 : 0.5 Spread 100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.40

2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm : 1075

: 7.40...7.60 travel mm

rpm : 1100 4th speed

: 8.00...8.20 travel mm

: 1150 5th speed rpm

: 9.00...9.20 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1125 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP Rack travel in m: 13.30...13.60 1st version START CUT-OUT rpm : 500 Speed Aneroid pressure h: 1050 1/min: 220 (240) Speed Del.quantity : 204.0...206.0 1000 : (201.0...209.0) FUEL DELIVERY CHARACTERISTICS Spread cm3 : 4.00 1000 : (7.00) 1st version RATED SPEED Aneroid pressure h: 1050 Speed rpm : 1050 1st version Del.quantity cm3/: 178.0...181.0 1000 s: (175.0...184.0) cm3 : 7.00 Control lever position degrees: 114...122 Spread 1000 s: (10.0) Testina: Aneroid pressure h: -1st rack travel in: 11.70 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rpm\_ : 500 Speed Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) rpm : 1155...1185 Speed cm3 : 7.00Spread 4th rack travel in: 1300 1000 s: (10.0) Speed rpm : 0.00...1.001.0W IDLE 1 **BREAKAWAY** Control lever position degrees: 80...88 1st version 1mm rack travel less than Testina: Speed rpm : 200 full load rack tr: 11.70 Minimum rack trave: 7.70 Speed rpm : 1090...1100 Speed rpm : 300 Rack travel in mm : 6.00...6.40 STARTING FUEL DELIVERY CONSTANT REGULATION Speed rem : 300...450 rpm : 100 Speed Del.quantity cm3/: 175.0...190.0 TORQUE CONTROL 1000 s: (171.0...194.0) Dimension a mm : 1.40 rpm : 1050 2nd speed Remarks: Rack travel in m: 12.70...12.90 3rd speed rpm : 500 Rack travel in m: 14.00...14.20 Aneroid/Altitude Compensator Test 1st version Setting rpm : 600 Speed Pressure hPa : -Rack travel mm : 11.40...11.70 Measurement Speed 1/min: 600 1st pressure hPa : 300 Rack travel in m: 12.30...12.50 2nd pressure hPa : 400

Note remarks

Test sheet : SCA

: 30.04.92 Edition Replaces : 11.91

Test oil : ISO-4113

Combination no. : 0 402 648 874

Injection pump

Pump designation : PE8P120A920/4LS7189

EP type number : 0 412 628 840

Governor

Governor design. : RQV200...950PA736-8

Governer no. : 0 421 813 815

Customer-spec. information Customer : SCANIA

: DSC14 10 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. \*C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 104

Openina

: 250...253 pressure, bar

Orifice plate

diameter mm : 0,7

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

x Lenath mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10 : (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-6-8

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 23.7...23.9

100 s: (23.4...24.2)

cm3 : 0.7Spread

100 s: (1.0)

2nd speed rpm : 250.0Rack travel in mm: 4.4...4.8

Del.quantity cm3/: 1.2...1.6

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.40...1.80

2nd speed rpm : 350

: 2.30...2.90 travel mm

3rd speed rpm : 650

: 4.40...5.00 travel mm

rpm : 995 4th speed

: 7.70...7.90 travel mm

: 1115 5th speed rpm

travel mm : 9.20...9.60

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1150 Speed

Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 237.0...239.0 1000 : (234.0...242.0)

G13

Spread

cm3 : 7.00 1000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 90...98

Testina:

1st rack travel in: 12.00

Speed rpm : 990...1000

2nd rack travel in: 4.00

Speed rpm : 1100...1130 4th rack travel in: 1250

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 41...49

Testing:

Speed rpm : 100 Minimum rack trave: 6.00

Speed rpm : 250

Rack travel in mm : 4.40...4.60

Rack travel in mm : 2.00

rpm : 375...435 Speed

Aneroid/Altitude Compensator Test

1st version

Setting:

Speed rom : 500

Pressure hPa : 900

Rack travel mm : 13.00...13.10

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.20 2nd pressure hPa : 525 Rack travel in m: 11.70...11.80 3rd pressure hPa : 320

Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 950

Del.quantity cm3/: 220.0...228.0 1000 s: (218.0...230.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 142.0...146.0

1000 s: (140.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...180.0

Rack travel in mm : 9.80...10.20

LOW IDLE

rpm : 250

Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks : 5.50...5.60 : (5.45...5.65) Prestroke mm Test sheet : MB 12,8 o Rack travel in mm : 20.00...21.00 Edition : 05.08.92 Replaces : 20.03.92 Firing order : 8- 7- 2- 6- 3- 5-Test oil : ISO-4113 Combination no. : 0 402 648 893 Injection pump Phasing : 0-45-90-135-180-225-Pump designation : PE8P120A320LS7835 270-315 EP type number : 0 412 628 847 Tolerance + - ° : 9.50 (0.75) Governor Governor design: : RQ300/950PA971-2 Time to cyl. no. : 8 Governer no. : 0 421 801 548 BASIC SETTING Customer-spec. information Customer : MERCEDES-BENZ 1st speed rpm: 600 Engine : 0M402 A Rack travel in mm: 14.10...14.30 1st version kW : 280.0 Del.quantity cm3/: 22.5...22.7 Rated speed : 1900 100 s: (22.2...23.0) TEST BENCH REQUIREMENTS cm3 : 0.6Spread Test oil inlet temp. °C : 38...42 100 s: (0.9) Overflow valve rpm : 300.02nd speed : 1 417 413 025 Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2 Inlet press., bar: 1.50 100 s: (1.3...2.5) c:n3 : 0.6 Spread Overflow 100 s: (1.0) quantity min. 1/h: 100...120 GUIDE SLEEVE POSITION Test nozzle holder Control-lever position : 1 688 901 105 assembly Degree: -2 Speed rpm : 600 **Opening** Rack travel in mm: 19.20...20.80 : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate diameter mm : 0,8 1st version Speed rpm : 600 Aneroid pressure h: 1000 Test lines : 1 680 750 075 Del.quantity : 225.0...227.0 1000 : (222.0...230.0) Outside diameter Spread

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values \_\_\_\_\_

Setting point:
 Speed rpm : 600

Rack travel in mm: 20.0 cm3 : 8.00 Spread 1000 s: (12.0) Testing: Arieroid pressure h: 1500 1st rack travel in: 12.90 Speed : 750 rpm rpm : 990...1005 Del.quantity cm3/: 234.0...238.0 1000 s: (231.0...241.0) Speed 2nd rack travel in: 4.00 rpm : 1070...1100 Speed Spread cm3 : 8.00 4th rack travel in: 1150 1000 s: (12.0) Speed rpm : 0.00...1.50Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed cm3 : 8.00 Spread Rack travel in mm: 6.2 1000 s: (12.0) Testing: : 200 Speed **BREAKAWAY** rom Minimum rack trave: 7.50 : 300 rom 1st version Rack travel in mm : 5.90...6.50 1mm rack travel less than Rack travel in mm: 2.00 rpm : 380...420 Speed full load rack tr: 12.90 rpm : 990...1005 Speed TORQUE CONTROL Dimension a mm : 0.50 STARTING FUEL DELIVERY nd speed rpm : 950 Rack travel in m: 13.90...14.10 2nd speed rpm : 800 3rd speed Speed rpm : 100 Rack travel in m: 14.70...14.90 Del.quantity cm3/: 40.0...70.0 1000 s: (36.0...74.0) Aneroid/Altitude Rack travel in mm: 10.10...10.40 Compensator Test Speed rpm : 100 Del.quantity cm3/: 210...230 \*\* 1st version 1000 s: (200...240) Setting rpm : 600 Speed Remarks: hPa : 1000 Pressure . Rack travel mm : 14.10...14.30 \* Increase in control-rod travel with Measurement respect to setting at least 0.1 mm Speed  $1/\min : 600$ 1st pressure hPa : 250 \*\* Value only applies to governor with Rack travel in m: 10.30...10.50 no TAS 2nd pressure hPa : 650 Rack travel in m: 13.10...13.30 3rd pressure hPa : 1200 Rack travel in m: 14.20...14.40 \* 4th pressure hPa : -Rack travel in m: 10.10...10.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 : 950 rom Del.quantity cm3/: 216.0...219.0 1000 s: (213.0...222.0)

Note remarks

Test sheet

: MB Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 893

Injection pump

Pump designation : PE8P120A320LS7835-10

EP type number : 0 412 628 853

Governor

Governor design: RQ300/950PA971-2

Governer no.

: 0 421 801 548

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

1st version kW : 280.0

: 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.9...6.5

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1200

: 230.0...232.0 Del.quantity

1000 : (227.0...235.0)

cm3 : 6.00 1000 : (9.00) Spread

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.00 Speed rpm : 990...1005 2nd rack travel in: 4.00 Speed rpm : 1070...1100 4th rack travel in: 1200 Speed rpm : 0.00...1.40LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.2 Testing: Speed rpm : 200 Minimum rack trave: 7.50 Speed rpm : 300 Rack travel in mm: 6.10...6.30 Rack travel in mm: 2.00 Speed rpm: 380...420 TORQUE CONTROL Dimension a mm : 0.50 2nd speed rpm : 950 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : 1200 Rack travel mm : 14.60...14.80 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.40 2nd pressure hPa : 250 Rack travel in m: 10.60...10.70 3rd pressure hPa : 700 Rack trayel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 950 Speed Del.quantity cm3/: 216.0...219.0 1000 s: (213.0...222.0)

cm3 : 8.00

1000 s: (12.0)

1st version
1mm rack travel less than

full load rack tr: 13.00 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 40.0...70.0 1000 s: (36.0...74.0)

Remarks:

Spread

## Note remarks

Test sheet : ME

Edition : 26.06.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 648 893X

Injection pump

Pump designation: PE8P12OA32OLS7835-10

EP type number : 0 412 628 853

Governor

Governor design. : RQ300/950PA971-2

Governer no. : 0 421 801 548

Cust. part no. : 0200740602

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

1st version kW : 280.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

**Overflow** 

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1200

Del.quantity : 230.0...232.0

1000 : (227.0...235.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600 COM Rack travel in mm: 20.0

Testing:

1st rack travel in: 13.00

Speed rpm : 990...1005

2nd rack travel in: 4.00

rpm : 1070...1100 Speed

4th rack travel in: 1200

rpm : 0.00...1.40 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.2

Testing:

Speed rpm : 200 Minimum rack trave: 7.50

rpm : 300

Rack travel in mm : 6.10...6.30

Rack travel in mm : 2.00

rpm : 380...420 Speed

TORQUE CONTROL

Dimension a mm : 0.50 2nd speed rpm : 950

Rack travel in m: 13.90...14.10

3rd speed rpm : 800

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 1200

Rack travel mm : 14.60...14.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.40 2nd pressure hPa : 250 Rack travel in m: 10.60...10.70 3rd pressure hPa : 700

Rack travel in m: 13.30...13.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 950

Del quantity cm3/: 216.0...219.0

1000 s: (213.0...222.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 990,..1005

STARTING FUEL DELIVERY

Speed

Speed rpm : 100 Del.quantity cm3/ : 40.0...70.0

1000 s: (36.0...74.0)

Remarks:

G20

Note remarks

Test sheet

: MB Edition : 26.06.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 648 894

Injection pump

Pump designation : PE8P120A320LS7835-10

EP type number

Governor

: 0 412 628 853

Governor design. : RQV300...950PA797-18

Governer no.

: 0 421 813 886

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M402 LA

1st version kW

: 280.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm 8.0:

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Firing order

Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

Spread

rpm: 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

rpm : 567 2nd speed

: 4.40...4.90 travel mm

rpm : 780 3rd speed

: 6.10...6.60 travel mm rpm : 1009 4th speed

travel mm

: 8.30...8.80

: 1092 5th speed man

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 980 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1200

: 230.0...232.0 Del.quantity

1000 : (227.0...235.0)

cm3 : 6.00 1000 : (9.00) Spread

RATED SPEED

1st version Control Lever

position degrees: 122...130

Testing:

1st rack travel in: 13.00 rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1070...1100 Speed

4th rack travel in: 1200

Speed rpm : 0.00...1.40

LOW IDLE 1 Control Lever

position degrees: 80...88

Testing:

Speed rom : 200 Minimum rack trave: 7.50 rpm

Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

: 250...360 Speed rom

TORQUE CONTROL

Dimension a mm : 0.50 2nd speed rpm : 950

Rack travel in m: 13.90...14.10

rpm : 800 3rd speed

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version

Settina

: 500 Speed rpm hPa : 1200 Pressure

: 14.60...14.80 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 10.10...10.40

2nd pressure hPa : 250

Rack travel in m: 10.60...10.70

3rd pressure hPa : 700

Rack travel in m. 13.30...13.50

START CUT-OUT

1/min : 240 (260) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 950 L.Du

Del.quantity cm3/: 216.0...219.0

1000 s: (213.0...222.0)

cm3 : 8.00Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.001000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 200.0...230.0 1000 s: (196.0...234.0)

Remarks:

**G22** 

#### Note remarks

Test sheet

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 648 894X

Injection pump

Pump designation : PE8P120A320LS7835-10

EP type number

: D 412 628 853

Governor

Governor design. : RQV300...950PA797-18

Governer no.

: 0 421 813 886

Cust. part no.

: 0200740702

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M402 LA

1st version kW

: 280.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order

: 8- 7- 2- 6- 3- 5-

4-1

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300

travel mm

: 1.00...1.50

2nd speed

rpm : 567

travel mm

: 4.40...4.90

3rd speed travel mm rpm : 780 : 6.10...6.60

4th speed

: 1009 rpm

travel mm

: 8.30...8.80

5th speed

travel mm

: 1092 rpm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 980 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1200

Del.quantity : 230.0...232.0

1000 : (227.0...235.0)

Spread cm3 : 6.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 122...130

Testina:

1st rack travel in: 13.00

rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1070...1100 Speed

4th rack travel in: 1200

rpm : 0.00...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 80...88

Testing:

Speed : 200 rpm Minimum rack trave: 7.50 Speed rpm : 300

Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

Speed rpm : 250...360

TORQUE CONTROL

: 0.50 Dimension a mm 2nd speed rpm : 950

Rack travel in m: 13.90...14.10

3rd speed rpm : 800

Rack travel in m: 14.60...14.80

Aneroid/Altitude

Compensator Test

1st version Setting

Speed : 500 man hPa : 1200 Pressure

: 14.60...14.80 Rack travel mm

Measurement

Speed 1/min: 500 ist pressure hPa : -

Rack travel in m: 10.10...10.30 2nd pressure hPa : 250 Rack travel in m: 10.60...10.70 3rd pressure hPa : 700

Rack travel in m: 13.30...13.50

START CUT-OUT

1/min: 240 (260) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 950 **Speed** 

Del.quantity cm3/: 216.0...219.0 1000 s: (213.0...222.0)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.001000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed : 100 LOW

Del.quantity cm3/: 200.0...230.0

1000 s: (196.0...234.0)

Remarks:

G24

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 26.06.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 895 Injection pump Pump designation: PE8P120A320LS7835-10 EP type number : 0 412 628 853 Governor Governor design. : RQ300/1050PA972-1 Governer no. : 0 421 801 545 Customer-spec. information Customer : MERCEDES-BENZ : 0M402 LA Engine : 280.0 1st version kW Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder assembly : 1 688 901 105 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_ G25

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-4-1 Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING rpm: 750 1st speed Rack travel in mm : 14.60...14.80 Del.quantity cm3/: 23.6...23.2 100 s: (22.7...23.5) Spread cm3 : 0.6100 s: (0.9) 2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5) Spread cm3 : 0.6100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 750 Aneroid pressure h: 1200 Del.quantity : 230.0...232.0 1000 : (227.0...235.0) : 6.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Setting point:

: 600

rom

Speed

Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.00 rom : 1090...1105 Speed 2nd rack travel in: 4.00 Speed rpm : 1170...1290 4th rack travel in: 1300 Speed rpm : 0.00...1.40LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm : 6.2 Testing: Speed rpm : 200 Minimum rack trave: 7.80 Speed rom : 300 Rack travel in mm : 6.10...6.30 Rack travel in mm : 2.00 rom : 380...420 Speed TORQUE CONTROL Dimension a mm : 0.50 2nd speed rpm : 1050 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 man Pressure hPa : 1200 Rack travel mm : 14.60...14.80 Measurement Speed  $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 250 Rack travel in m: 10.60...10.70 3rd pressure hPa : 700 Rack travel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/ : 214.0...217.0

1000 s: (211.0...220.0)

cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.001000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1090...1105 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 40.0...70.0 1000 s: (36.0...74.0) Remarks:

Spread

Note remarks

Test sheet

: MB

Edition

: 26,06,92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 648 895X

Injection pump

Pump designation : PE8P12DA32DLS7835-10

EP type number

: 0 412 628 853

Governor

Governor design.

: RQ300/1050PA972-1

Governer no.

: 0 421 801 545

Cust, part no.

: 0180742102

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M402 LA

1st version kW

: 280.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order

: 8-7-2-6-3-5-4-1

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rom: 750

Rack travel in mm : 14.60...14.80

Del.guantity cm3/: 23.0...23.2

100 s: (20 7...23.5)

Spread

cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

Speed

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 750

Aneroid pressure h: 1200 Del.quantity

: 230.0...232.0 1000 : (227.0...235.0)

Spread

: 6.00 cm3

1000 : (9.00)

RATED SPEED

1st version Setting point: Speed man Rack travel in mm: 20.0 Testina: 1st rack travel in: 13.00 Speed rpm : 1090...1105 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 rpm : 0.00...1.40Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 6.2 Testina: rpm : 200 Speed Minimum rack trave: 7.80 Speed rpm : 300 Rack travel in mm : 6.10...6.30 Rack travel in mm: 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm : 0.50 2nd speed rpm : 1050 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 non Pressure hPa : 1200 Rack travel mm : 14.60...14.80 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 10.10...10.40 2nd pressure hPa : 250

Rack travel in m: 10.60...10.70 3rd pressure hPa : 700 Rack travel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200

rpm : 1050 Del.quantity cm3/: 214.0...217.0 1000 s: (211.0...220.0) Spread cm3: 8.00 1000 s: (12.0) Ameroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) cm3 : 8.00 Spread 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.00 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 40.0...70.0 1000 s: (36.0...74.0)

Remarks:

**G28** 

Note remarks

Test sheet

Edition

: MB

Replaces

: 26.06.92

Test oil

: ISO-4113

Combination no.

: 0 402 648 899

Injection pump

Pump designation : PE8P120A320LS7839-10

EP type number

: 0 412 628 855

Governor

Governor design. : RQ300/950PA971-5

Governer no.

: 0 421 801 559

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M442 LA

1st version kW

: 370.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 075

Outside diameter x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25... 27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Firing order

Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-

Phasina

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 600

Rack travel in mm : 14.90...15.10

Deliquantity cm3/ . 25.6...25.3

100 s: (25.3...26.1)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 6.0...6.6

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

rpm : 600

Aneroid pressure h: 1050

Del.quantity

: 256.0...258.0

1000 : (253.0...261.0)

cm3

: 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rpm

: 600

Rack travel in mm: 20.0 Testing: 1st rack travel in: 15.30 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rom : 1075...1105 Speed 4th rack travel in: 1150 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 6.3 Testing: : 200 Speed rom Minimum rack trave: 7.60 : 300 (TOM Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00 Speed : 370...410 rom Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm Pressure hPa : 1050 Rack travel mm : 14.90...15.10 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 800 Rack travel in m: 13.80...14.00 3rd pressure hPa : 1200 Rack travel in m: 15.00...15.10 \* 4th pressure hPa : 1500 Rack travel in m: 15.60...15.80 5th pressure hPa : -Rack travel in m: 9.30...9.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 2000 Speed rpm : 950 Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 2000

Del.quantity cm3/: 283.0...287.0 1000 s: (280.0...290.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.00 1000 s: (12.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 15.30 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 9.30...9.60

## Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Speed

rom

: 800

Note remarks

Test sheet : MB

Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 902

Injection pump

Pump designation : PE8P120A320LS7839-10

EP type number : 0 412 628 855

Governor

Governor design. : RQ300/1050PA972-5

Governer no. : 0 421 801 564

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442 LA

1st version kW : 370.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.53

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15) Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

4-1

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 6.0...6.6

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1050

: 256.0...258.0 Del.quantity

1000 : (253.0...261.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testina: 1st rack travel in: 15.20 Speed rpm : 1090...1105 2nd rack travel in: 4.00 : 1160...1190 Speed rom 4th rack travel in: 1250 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 6.3 Testina: Speed : 200 rpm Minimum rack trave: 7.80 : 300 man Rack travel in mm : 6.20...6.40 Rack travel in mm: 2.00 : 380...420 Speed rpm TORQUE CONTROL Dimension a mm : 1050 2nd speed וחמרו Rack travel in m: 16.20...16.40 rpm : 800 3rd speed Rack travel in m: 16.40...16.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 man hPa : 1050 Pressure Rack travel mm : 14,90...15.10 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 800 Rack travel in m: 13.80...14.00 3rd pressure hPa : 1200 Rack travel in m: 15.00...15.10 \* 4th pressure hPa : 1500 Rack travel in m: 15.60...15.80 5th pressure hPa : -Rack travel in m: 9.30...9.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 2000 Speed rom : 1050

Del.quantity cm3/: 271.0...274.0 1000 s: (268.0...277.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 2000 rpm : 800 Del.quantity cm3/: 276.0...280.0 1000 s: (273.0...283.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quaritity cm3/ : 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00 Spread 1000 s: (12.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

tull load rack tr: 15.20 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 9.30...9.60

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB

Edition : 31.07.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 907

Injection pump

Fump designation : PE8P120A320LS7839-10

EP type number : 0 412 628 855

Governor

Governor design. : RQV300...950PA797-22

Governer no. : 0 421 813 909

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442 LA

1st version kW : 370.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 20.00...21.00 Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 617

travel mm : 5.00...5.50 rpm : 780 3rd speed

travel mm

: 6.10...6.60 4th speed

rpm : 1010

: 8.30...8.80 travel mm

rpm : 1092 5th speed

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1020 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1050

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm3 : 6.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 118...126

Testina:

1st rack travel in: 15.00 Speed rpm : 990...1000

2nd rack travel in: 4.00 rpm : 1100...1130 Speed

4th rack travel in: 1200

rpm : 0.00...1.40Speed

LOW IDLE 1 Control lever

position degrees: 82...90

Testing:

Speed : 200 rpra Minimum rack trave: 8.00 rpm : 300 Speed

Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

rpm : 300...400 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 600 rom hPa : 1050 Pressure

Rack travel mm : 14.90...15.10

Measurement

1/min: 600 Speed

1st pressure hPa : 350

Rack travel in m: 10.00...10.20

2nd pressure hPa : 800

Rack travel in m: 13.80...14.00 3rd pressure hPa : 1200 Rack travel in m: 15.00...15.10 \*

4th pressure hPa : 1500 Rack travel in m: 15.60...15.80

5th pressure hPa : -

Rack travel in m: 9.30...9.60

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000

: 950 rpm

Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0)

cm3 : 8.00

Spread 1000 s: (12.0)

Aneroid pressure h: 2000 : 800 Speed

rpm Del.quantity cm3/: 286.0...290.0

1000 s: (283.0...286.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h:

rpm : 500 Speed

Del.quantity cm3/: 136.0...138.0

1000 s: (133.0...141.0)

cm3 : 8.00 Spread 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.00

Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 275.0...295.0

1000 s: (271.0...299.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks : 5.20...5.30 : (5.15...5.35) Prestroke mm Test sheet : MB 14,7 u 2 : 30.04.92 Edition Rack travel in mm : 20.00...21.00 : 11.91 Replaces : 8-7-2-6-3-5-Firing order Test oil : ISO-4113 4-1 Combination no. : 0 402 648 909 Injection pump Phasing : 0-45-90-135-180-225-Pump designation : PE8P120A320LS7849 270-315 EP type number : O 412 628 850 Tolerance + - ° : 0.50 (0.75) Governor Governor design. : RQ300/950PA971-6 Time to cyl. no. : 8 Governer no. : 0 421 801 575 BASIC SETTING Customer-spec. information Customer : MERCEDES-BENZ 1st speed rpm: 600 Engine : OM442 A Rack travel in mm : 13.40...13.60 1st version kW : 250.0 Del.quantity cm3/: 20.7...20.9 : 1900 Rated speed 100 s: (20.4...21.2) TEST BENCH REQUIREMENTS Spread cm3 : 0.6Test oil inlet temp. °C : 38...42 100 s: (0.9) Overflow valve 2nd speed rpm : 300.0: 1 419 992 198 Rack travel in mm: 7.0...7.4 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.8 Inlet press., bar: 1.50 Spread Overflow 100 s: (1.2) quantity min. 1/h: 100...123 GUIDE SLEEVE POSITION Test nozzle holder Control-lever position : 1 688 901 105 assembly Degree: -2 rpm : 600 Opening. Rack travel in mm: 19.20...20.80 pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate diameter mm : 0,8 1st version Speed rpm : 600 Aneroid pressure h: 800 Test Lines : 1 680 750 075 Del.quantity : 207.0...209.0 1000 : (204.0...212.0) Outside diameter : 6.00 Spread cm3 x Wall thickness 1000 : (9.00) x Length mm : 8.00x2.50x1000 RATED SPEED

1st version

Speed

Setting point:

: 600

rpm

H07

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

Rack travel in mm : 20.0 Testing: 1st rack travel in: 12.60 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1150 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.5 Testing: Speed rpm : 200 Minimum rack trave: 7.60 rpm : 300 Rack travel in mm : 6.20...6.80 Rack travel in mm : 2.00 Speed : 380...420 rom TORQUE CONTROL : 950 2nd speed rpm Rack travel in m: 13.50...13.70 3rd speed rpm : 800 Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rpm hPa : 800 Pressure Rack travel mm : 13.40...13.60 Measurement 1/min: 600 Speed 1st pressure hPa : 345 Rack travel in m: 11.70...11.90 2nd pressure hPa : 600 Rack travel in m: 12.90...13.10 3rd pressure hPa : 1050 Rack travel in m: 13.60...13.70 4th pressure hPa : 1100 Rack travel in m: 13.90...14.10 5th pressure hPa :-Rack travel in m: 10.90...11.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 Speed rpm : 950

Del.quantity cm3/: 208.5...211.5 1000 s: (205.5...214.5) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1500 : 800 Speed rpm Del.quantity cm3/: 225.0...229.0 1000 s: (221.0...232.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 127.0...129.0 1000 s: (124.0...132.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.60

rpm : 990...1005

Remarks:

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks Prestroke mm : 5.20...5.30 Test sheet : (5.15...5.35) Edition : 30.04.92 Rack travel in mm : 20.00...21.00 Replaces Firing order : 3-7-2-6-3-5-Test oil : 150-4113 4-1 Combination no. : 0 402 648 910 Injection pump Phasing : 0-45-90-135-180-225-Pump designation: PE8P120A320LS7840-10 270-315 EP type number : 0 412 628 856 Tolerance + - ° : 0.50 (0.75) Governor Governor design. : RQV300..950PA797-26 Time to cyl. no. : 8 Governer no. : 0 421 813 915 BASIC SETTING Customer spec. information Customer : MERCEDES-BENZ 1st speed rpm: 600 Engine : OM442 A Rack travel in mm : 13.40...13.60 1st version kW : 250.0 Del.quantity cm3/: 20.7...20.9 : 1900 Rated speed 100 s: (20.4...21.2) TEST BENCH REQUIREMENTS Spread cm3 : 0.6 Test oil inlet temp. °C : 38...42 100 s: (0.9) Overflow valve rpm : 300.02nd speed : 1 419 992 198 Rack travel in mm: 6.9...7.5 Del.quantity cm3/: 1.6...2.2 Inlet press., bar: 1.50 100 s: (1.3...2.5) cm3 : 0.8 Spread Overflow 100 s: (1.2) quantity min. 1/h: 100...120 (B) Setting of injection pump Test nozzle holder with governor : 1 688 901 105 assembly GUIDE SLEEVE TRAVEL Opening 1st speed rpm : 300 pressure, bar : 207...210 : 1.00...1.50 travel mm 2nd speed rpm : 617 Orifice plate : 5.00...5.50 travel mm diameter mm : 0,8 3rd speed rpm : 780 travel mm : 6.10...6.60 : 1009 4th speed rpm Test lines : 1 680 750 075 travel mm : 8.30...8.80 : 1092 5th speed rpm Outside diameter : 9.80...10.30 travel mm x Wall thickness x Length mm : 8.00x2.50x1000 GUIDE SLEEVE POSITION Control-lever position (A) Injection pump setting values Degree: -1 Insp. values in parentheses rpm : 1020 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

Set equal delivery quant.

per values \_\_\_\_

1st version rpm : 600 Speed Aneroid pressure h: 800 : 207.0...209.0 Del.quantity 1000 : (204.0...212.0) Spiread : 6.00 cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 118...126 Testing: 1st rack travel in: 12.60 rom : 990...1000 Speed 2nd rack travel in: 4.00 Speed rpm : 1070...1100 4th rack travel in: 1200 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed MON : 200 Minimum rack trave: 8.50 : 300 Speed rpm Rack travel in mm : 6.90...7.50 CONSTAINT REGULATION Speed rpm : 300...450 TORQUE CONTROL Dimension a mm : 0.60 rpm : 950 2nd speed Rack travel in m: 13.50...13.70 3rd speed rpm : 800 Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 600 Pressure hPa : 800 : 13.40...13.60 Rack travel mm Measurement Speed  $1/\min : 600$ 1st pressure hPa : 350 Rack travel in m: 11.70...11.90 2nd pressure hPa : 650 Rack travel in m: 12.90...13.10

Rack travel in m: 13.60...13.70 4th pressure hPa : 1100 Rack travel in m: 13.90...14.10 5th pressure hPa : -Rack travel in m: 10.90...11.10 START CUT-OUT Speed 1/min : 240 (260) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 Speed rpm : 950
Del.quantity cm3/: 208.5...211.5
1000 s: (205.5...214.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 Speed : 800 rom Del.quantity cm3/: 225.0...229.0 1000 s: (221.0...232.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 127.0...129.0 1000 s: (124.0...132.0) cm3 : 8.00Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.60 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rom Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) Remarks:

3rd pressure hPa : 1000

Note remarks

: MB Test sheet

Edition : 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 648 911

Injection pump

Pump designation: PE8P120A320LS7839-10

EP type number

: 0 412 628 855

Governor

Governor design. : RQV300...1050PA797

-27

Governer no.

: 0 421 813 916

Customer-spec. information

Customer

: MERCEDES-BENZ

**Enaine** 

: 0M442 1A

1st version kW

: 370.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10 : (4.95...5.15)

Rack travel in mm : 20.00...21.00

Firing order

: 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

Spread

cm3 : 0.6

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm : 6.0...6.6

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300

: 1.00...1.50 travel mm

2nd speed

rpm : 558

: 4.30...4.80 travel mm

3rd speed rpm : 820

travel mm : 5.90...6.40

4th speed : 1108 rpm

: 8.30...8.80 travel mm

5th speed

Speed

rpm : 1183 : 8.30...8.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

Rack travel in m: 13.80 ..14.00

3rd pressure hPa : 1200
Rack travel in m: 15.00...15.10 \*

4th pressure hPa : 1600
Rack travel in m: 15.60...15.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1050 256.0...258.0 1000 : (253.0...261.6) Del. quantity 5th pressure hPa : -Rack travei in m: 9.30...9.60 Spread : 6.00 cm3 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 220 (240) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 118...126 1st version Testing: Aneroid pressure h: 2000 1st rack travel in: 15.20 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1050 Del.quantity cm3/: 271.0...274.0 1000 s: (268.0...277.0) rpm : 1175...1205 Speed Spread cm3 : 8.004th rack travel in: 1250 1000 s: (12.0) rpm : 0.00...1.50 Speed Aneroid pressure h: 2000 : 800 rpm Del.quantity cm3/: 276.0...280.0 LOW IDLE 1 Control lever 1000 s: (273.0...283.0) position degrees: 76...84 cm3 : 8.00Spread 1000 s: (12.0) Testina: Aneroid pressure h: -Speed Speed rpm : 500 Del.quantity cm3/: 136.0...138.0 : 200 rpm Minimum rack trave: 6.80 : 300 1000 s: (133.0...141.0) rpm Rack travel in mm : 6.20...6.40 cm3 : 8.00 Spread 1000 s: (12.0) CONSTANT REGULATION Speed rpm : 300...450 **BREAKAWAY** TORQUE CONTROL Dimension a mm : 0.20 1st version 2nd speed rpm : 1050 1mm rack travel less than Rack travel in m: 16.20...16.40 3rd speed rpm : 800 full load rack tr: 15.20 Rack travel in m: 16.40...16.60 Speed rpm : 1090...1100 Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test rpm : 100 Speed Del.quantity cm3/: 275.0...295.0 1000 s: (271.0...299.0) 1st version Setting Speed : 600 rom Pressure hPa : 1050 Remarks: : 14.90...15.10 Rack travel mm Measurement \* Increase in control-rod travel with 1/min: 600 Speed respect to setting at least 0.1 mm 1st pressure hPa : 350 Rack travel in m: 10.00...10.20

2nd pressure hPa : 800

Note remarks

Test sheet : FIA 17,2 f Edition : 31.07.92 Replaces : 03.92

Test oil : ISO-4113

Combination no. : 0 402 648 912

Injection pump

Pump designation : PE8P130A920/5LS7841

EP type number : 0 412 638 803

Governor

Governor design: : RQV300...950PA994K

: 0 421 815 275 Governer no.

Customer spec. information Customer : IVECO-FIAT

: 8280.42.050 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95,..5.15)

Rack travel in mm : 11.50...12.50

Phasing : 0-45-90-135-180-225-

: 1-8-4-3-6-5-

270-315 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 11.5...12.5 Difference ° CS : 1.25...2.75

BASIC SETTING

Firing order

1st speed rpm : 550

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.8

rpm : 300.02nd speed Rack travel in mm: 4.4...4.8 Del.quantity cm3/: 2.2...2.8 100 s: (1.9...3.1)

Spread cm3 : 0.5

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995

: 10.20...10.40 travel mm

2nd speed rpm : 300

travel mm : 2.00...2.30

3rd speed rpm : 700

travel mm : 5.80...6.20

rpm : 1200 4th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1000 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550 Aneroid pressure h: 900

Del.quantity : 209.0...211.0 1000 : (206.0...214.0) cm3 : 8.00Spread

RATED SPEED

1st version Control Lever

position degrees: 109...117

Testing:

1st rack travel in: 10.10 Speed rpm : 990...1000 2nd rack travel in: 4.00

rpm : 1035...1065 Speed

4th rack travel in: 1200 Speed rpm : 0.03...1.00

LOW IDLE 1 Control lever

position degrees: 58...66

Testing:

Speed : 200 rom Minimum rack trave: 6.10 rom

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 310...440

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 550

Rack travel in m: 10.70...10.80

2nd speed rpm : 950

Rack travel in m: 11.00...11.20

3rd speed rpm : 750

Rack travel in m: 10.90...11.20

4th speed rpm : 400

Rack travel in m: 10.40...10.70

Aneroid/Altitude Compensator Test

1st version Setting

Speed man : 950 hPa : 900

Rack travel mm : 10.50...10.60

Measurement

Speed 1/min: 950

1st pressure hPa : -

Rack travel in m: 7.40...7.60

2nd pressure hPa : 300

Rack travel in m: 9.90...10.00

3rd pressure hPa : 230

Rack travel in m: 8.80...9.20

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 950
Del.quantity cm3/: 217.0...221.0
1000 s: (214.0...224.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 145.0...147.0 1000 s: (142.0...150.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 185.0...205.0

1000 s: (181.0...209.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 4.40...4.80 Del.quantity cm3/: 22.0...28.0 1000 s: (19.0...31.0)

cm3 : 5.00 Spread

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : FIA 17,2 f1 Edition : 31.07.92

Replaces : 03.92 Test oil : ISO-4113

Combination no. : 0 402 648 913

Injection pump

Pump designation : PE8P130A920/5LS7841

EP type number : 0 412 638 803

Governor

Governor design. : RQV250...950PA994-1K

: 0 421 815 276 Governer no.

Customer-spec. information Customer : IVECO-FIAT

: 8280.42.350 SPR Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15) Rack travel in mm : 11.50...12.50 : 1-8-4-3-6-5-7-2

Phasing : 0-45-90-135-180-225-

270-315 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 11.5...12.5 Difference ° CS : 1.25...2.75

BASIC SETTING

Firing order

1st speed rpm : 550

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 22.8...23.0

100 s: (22.5...23.3)

Spread cm3 : 0.8

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm: 4.0...4.4 Del.quantity cm3/: 2.2...2.8

100 s: (1.9...3.1) cm3 : 0.5

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

travel mm : 10.20...10.40

2nd speed rpm : 300

: 2.00...2.30 travel mm

3rd speed rpm : 700

travel mm : 5.80...6.20

4th speed rpm : 1200

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1040

Rack travel in mm : 9.00...11.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550 Aneroid pressure h: 900 Del.quantity : 228.0...230.0 1000 : (225.0...233.0) cm3 : 8.00 1000 ; (9.00) Spread RATED SPEED 1st version Control Lever position degrees: 110...118 Testing: 1st rack travel in: 10.30 Speed rpm : 990...1000 2nd rack travel in: 4.00 Speed rpm : 1045...1075 4th rack travel in: 1200 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 58...66 Testing: Speed rpm : 200 Minimum rack trave: 5.70 Speed rpm : 300 Rack travel in mm : 4.10...4.30 CONSTANT REGULATION rpm : 310...440 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 550 Rack travel in m: 10.90...11.00 2nd speed rpm : 950 Rack travel in m: 11.40...11.60 3rd speed rpm : 650 Rack travel in m: 11.10...11.40 4th speed rpm : 400 Rack travel in m: 10.40...10.70 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 950 Pressure hPa : 900 Rack travel mm : 11.30...11.40 Measurement

Rack travel in m: 7.10...7.30 2nd pressure hPa : 450 Rack travel in m: 10.60...10.70 3rd pressure hPa : 280 Rack travel in m: 8.30...8.70 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm: 950
Del.quantity cm3/: 251.0...255.0
1000 s: (248.0...258.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 140.0...142.0 1000 s: (137.0...145.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.30 Speed rpm : 990...1000 STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 185.0...205.0 1000 s: (181.0...209.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.00...4.40 Del.quantity cm3/: 22.0...28.0 1000 s: (19.0...31.0) cm3 : 5.00 1000 s: (12.00) Spread Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Speed 1/min: 950

1st pressure hPa : -

Note remarks

Test sheet : MB

Edition : 26.06.92

Replaces

Test oil : ISO-4113

: 0 402 648 914 Combination no.

Injection purp

Pump designation : PE8P120A320LS7835-10

EP type number : 0 412 628 853

Governor

Governor design. : RQV300...1050PA797

-30

: 0 421 813 921 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 A

1st version kW : 280.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.00...1.50 travel mm

2nd speed rpm : 608

travel mm : 4.80...5.30

3rd speed rpm : 820

: 5.90...6.40 travel mm

4th speed rpm : 1108

travel mm : 8.10...8.60

rpm : 1190 5th speed

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1130 Speed

Rack travel in mm : 12.60...15.20

FULL LOAD DELIV. AT FULL LOAD STOP Rack travel in m: 10.60...10.70 3rd pressure hPa : 700 1st version Rack travel in m: 13.30...13.50 Speed rpm : 750 Aneroid pressure h: 1200 START CUT-OUT Del.quantity : 230.0...232.0 1000 : (227.0...235.0) 1/min : 220 (240) Speed Spread cm3 : 6.00 1000 : (9.00) FUEL DELIVERY CHARACTERISTICS RATED SPEED 1st version 1st version Aneroid pressure h: 1200 Speed rpm : 1050
Del.quantity cm3/ : 214.0...217.0
1000 s: (211.0...220.0) Control lever position degrees: 118...126 Testing: Spread cm3 : 8.00 1st rack travel in: 13.00 1000 s: (12.0) rpm : 1090...1100 Aneroid pressure h: -2nd rack travel in: 4.00 : 500 Speed rom Del.quantity cm3/: 134.0...136.0 Speed rpm : 1170...1200 4th rack travel in: 1300 1000 s: (131.0...139.0) Speed rpm : 0.00...1.40Spread cm3 : 8.00 1000 s: (12.0) LOW IDLE 1 Control Lever position degrees: 82...90 BREAKAWAY Testing: 1st version Speed rpm : 200 Minimum rack trave: 7.80 1mm rack travel less than rpm : 300 full load rack tr: 13.00 Rack travel in mm: 6.10...6.30 Speed rpm : 1090...1100 CONSTANT REGULATION STARTING FUEL DELIVERY nom : 300...500 Speed Speed rpm : 100 Del.quantity cm3/ : 200.0...230.0 1000 s: (196.0...234.0) TORQUE CONTROL Dimension a mm : 0.60 2nd speed rpm : 1050 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Remarks: Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom. Pressure hPa : 1200 : 14.60...14.80 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.40 2nd pressure hPa : 250

#### Note remarks

Test sheet

Edition : 25,06,92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 914X

Injection pump

Pump designation : PE8P120A320LS7835-10

EP type number : 0 412 628 853

Governor

Governor design. : RQV300...1050PA797

-30

Governer no. : 0 421 813 921

: 0180742202 Cust. part no.

Customer-spec, information

Customer : MERCEDES-BENZ

Engine : 0M402 A

: 280.0 1st version kW : 2103 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 33...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm: 20.00...21.00 Firing order : 8-7-2-6-3-5-

: 4-1 Firing order

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm: 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

cm3 : 0.6 Spread

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.00...1.50 travel mm

2nd speed rpm : 608

: 4.80...5.30 travel mm

rpm : 820 3rd speed

: 5.90...6.40 travel mm rpm : 1108

4th speed

: 8.10...8.60 travel mm

rpm : 1190 5th speed

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1130 Rack travel in mm : 12.60...15.20 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 750 Aneroid pressure h: 1200 Del.quantity : 250.0...235.0) : 6.00 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 118...126 Testing: 1st rack travel in: 13.00 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rom : 1170...1200 Speed 4th rack travel in: 1300 rpm : 0.00...1.40 Speed LOW IDLE 1 Control Lever position degrees: 82...90 Testina: Speed : 200 rpm Minimum rack trave: 7.80 : 300 Speed rpm Rack travel in mm : 6.10...6.30 CONSTANT REGULATION Speed rom : 300...500 TORQUE CONTROL Dimension a mm : 0.60 2nd speed rpm : 1050 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Rack travel in m: 14.60...14.80 Ameroid/Altitude Compensator Test 1st version Setting Speed : 500 man. hPa : 1200 Pressure Rack travel mm : 14.60...14.80 Measurement 1/min: 500 Speed

ist pressure hPa : -Rack travel in m: 10.10...10.40 2nd pressure hPa : 250 Rack travel in m: 10.60...10.70 3rd pressure hPa : 700 Rack travel in m: 13.30...13.50 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/ : 214.0...217.0 1000 s: (211.0...220.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 200.0...230.0 1000 s: (196.0...234.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 26,06.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 915 Injection pump Pump designation: PE8P120A320LS7835-10 EP type number : 0 412 628 853 Governor Governor design. : RQ300/1050PA993-1 : 0 421 801 582 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M402 LA 1st version kW : 21000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder assembly : 1 688 901 105 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075

: (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-4-1 **Phasing** : 0-45-90-135-130-225-270-315 Tolerance + - \* : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rom: 750 Rack travel in mm : 14.60...14.80 Del.quantity cm3/: 23.0...23.2 100 s: (22.7...23.5) Spread cm3 : 0.6100 s: (0.9) rpm : 300.0 2nd speed Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) Spread cm3 : 0.6100 s: (1.0) GUIDE SLEEVE POSITION Control-Lever position Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 750 Speed Aneroid pressure h: 1200 : 230.0...232.0 Del.quantity 1000 : (227.0...235.0) : 6.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Setting point: Speed : 600 rom Rack travel in mm: 20.0

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

Outside diameter

x Wall thickness

per values

BEGINNING OF DELIVERY

: 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

x Length mm

Testina:

1st rack travel in: 13.00

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

: 1170...1200 Speed rpm

4th rack travel in: 1300

rpm : 0.00...1.40 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm : 6.2

Testing:

: 200 Speed rom

Minimum rack trave: 7.80

Speed : 300 rom

Rack travel in mm : 6.10...6.30

Rack travel in mm: 2.00

Speed : 380...420 rpm

TORQUE CONTROL

Dimension a mm : 0.50

2nd speed rpm

nd speed rpm : 1050 Rack travel in m: 13.90...14.10

3rd speed rpm : 800

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version

Settina

Speed man : 500 Pressure

hPa : 1200

Rack travel : 14.60...14.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.40

2nd pressure hPa : 250
Rack travel in m: 10.60...10.70
3rd pressure hPa : 700
Rack travel in m: 13.30...13.50

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm

Del.quantity cm3/ : 214.0...217.0

1000 s: (211.0...220.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed MOU

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

Speed : 100 CDM

Del.quantity cm3/: 200.0...230.0

1000 s: (196.0...234.0)

Remarks:

Note remarks

Test sheet :

Edition : 26.06.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 648 915X

Injection pump

Pump designation : PE8P12OA320LS7835-10

EP type number : 0 412 628 853

Governor

Governor design. : RQ300/1050PA993-1

Governer no.

: 0 421 801 582

Cust. part no. : 0200747202

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

1st version kW : 280.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Frack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 750

Rack travel in mm: 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3: 0.6

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm: 750 Aneroid pressure h: 1200

Del.quantity : 230.0...232.0

1000 : (227.0...235.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed וחכורו Rack travel in mm: 20.0

Testina:

1st rack travel in: 13.00

Speed rpm : 1090...1105

2rid rack travel in: 4.00

rpm : 1170...1200 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Testing:

Speed : 200 rpm

Minimum rack trave: 7.80

rpm : 300

Rack travel in mm : 6.10...6.30

Rack travel in mm : 2.00

: 380...420 Speed rom

TORQUE CONTROL

Dimension a mm : 0.50

: 1050 2nd speed rpm

Rack travel in m: 13.90...14.10

rpm : 800 3rd speed

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 1200 Pressure

Rack travel mm : 14.60...14.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.10...10.40 2nd pressure hPa : 250

Rack travel in m: 10.60...10.70 3rd pressure hPa : 700

Rack travel in m: 13.30...13.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1050 Del.quantity cm3/ : 214.0...217.0 1000 s: (211.0...220.0)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

Spread

cm3 : 8.00

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 200.0...230.0

:

1000 s: (196.0...234.0)

Remarks:

H24

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 26.06.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 917 Injection pump Pump designation : PE8P120A320LS7839-10 EP type number : 0 412 628 855 Governor Governor design. : R0300/1050PA993-3 Governer no. : 0 421 801 601 Customer-spec. information Customer : MERCEDES-BENZ Engine : 04442 LA 1st version kW : 370.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder assembly : 1 688 901 105 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 20.00...21.00 Firing order : 8- 7- 2- 6- 3- 5-Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rom: 600 Rack travel in mm: 14.90...15.10 Del.quantity cm3/: 25.6...25.8 100 s: (25.3...26.1) Spread cm3 : 0.6 100 s: (0.9) 2nd speed rpm : 300.0Rack travel in mm: 6.0...6.6 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6Spread 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 Speed rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1050 Del.quantity : 256.0...258.0 1000 : (253.0...261.0) cm3 : 6.00 Spread 1000 : (9.00) RATED SPEED 1st version Setting point:

Speed

riom

: 600

per values

Rack travel in mm: 20.0 Testina: 1st rack travel in: 15.20 Speed rom: 1090...1105 2nd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1250 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed : 300 rom Rack travel in mm: 6.3 Testing: Speed rpm : 200 Minimum rack trave: 7.20 : 300 rpm Speed Rack travel in mm : 6.20...6.40 Rack travel in mm : 2.00 Speed rpm : 380...420 TORQUE CONTROL Dimension a mm 2nd speed rpm : 1050 Rack travel in m: 16.20...16.40 3rd speed rpm : 800 Rack travel in m: 16.40...16.60 Aneroid/Altitude Compensator Test 1st version Settina Speed rpm : 600 Pressure hPa : 1050 Rack travel mm : 14.90...15.10 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 800 Rack travel in m: 13.80...14.00 3rd pressure hPa : 1200 Rack travel in m: 15.00...15.10 \*

1st version Aneroid pressure h: 2000 Speed rpm : 1050 Del.quantity cm3/: 271.0...274.0 1000 s: (268.0...277.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 2000 Speed rpm : 800 Del.quantity cm3/: 276.0...283.0 1000 s: (273.0...283.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 15.20 Speed rpm : 1090...1105 STARTING FUEL DELIVERY Speed rpm Del.quantity cm3/: 275.0...295.0 1000 s: (271.0...299.0) Remarks: \* Increase in control-rod travel with respect to setting at least 0.1 mm

Speed

4th pressure hPa : 1500

5th pressure hPa :

START CUT-OUT

Rack travel in m: 15.60...15.80

1/min: 220 (240)

Rack travel in m: 9.30...9.60

FUEL DELIVERY CHARACTERISTICS

Note remarks

Test sheet : MB

: 26.06.92 Edition

Replaces

Test oil : ISO-4113

: 0 402 648 921 Combination no.

Injection pump

Pump designation : PE8P120A320LS7839-10

: 0 412 628 855 EP type number

Governor

Governor design. : RQ300/950PA993-8

: 0 421 801 618 Governer no.

Customer-spec, information

Customer : MERCEDEL-BENZ

Engine : 0M442 LA

: 370.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15)
Rack travel in mm : 20.00...21.00 Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

: 8 Time to cyl. no.

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 6.0...6.6

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1050 Del.quantity

: 256.0...258.0 1000 : (253.0...261.0)

: 6.00 cm3

1000 : (9.00)

RATED SPEED

Spread

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm : 20.0 Testina: 1st rack travel in: 15.30 rom : 990...1005 Speed 2nd rack travel in: 4.00 : 1075...1105 Speed rom 4th rack travel in: 1150 rom : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 6.3 Testina: : 200 Speed rpm Minimum rack trave: 7.60 : 300 Speed rom Rack travel in mm : 6.20...6.40 Rack travel in mm: 2.00 Speed rpm : 380...420 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed mom hPa : 1050 Pressure Rack travel mm : 14.90...15.10 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 800 Rack travel in m: 13.80...14.00 3rd pressure hPa : 1200 Rack travel in m: 15.00...15.10 \* 4th pressure hPa : 1500 Rack travel in m: 15.60...15.80 5th pressure hPa : -Rack travel in m: 9.30...9.60 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 2000 rpm : 950 Speed Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0)

cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 2000 Speed rpm : 800 Del.quantity cm3/: 286.0...290.0 1000 s: (283.0...293.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.001000 s: (12.0)

## BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 15.30 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0)

## Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB 14,7 z Edition : 30.04.92 : 11.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 923

Injection pump

Pump designation : PE8P120A320LS7840-1

EP type number : 0 412 628 862

Governor

: RQV350...1050PA866 Governor design.

-16

Governer no. : 0 421 813 961

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442 A

1st version kW : 250.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.20...13.40

Del.quantity cm3/: 20.8...21.0

100 s: (20.5...21.3)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.8...6.4 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.30...1.80 travel mm

rpm : 454 2nd speed

travel mm : 2.80...3.30

3rd speed rpm : 900

: 5.40...5.90 travel mm

rpm : 1107 4th speed

travel mm : 7.80...8.30

5th speed rpm : 1204

travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1120

Rack travel in mm : 15.20...17.80

Rack travel in m: 12.20...12.40
3rd pressure hPa : 1050
Rack travel in m: 13.30...13.40 \*
4th pressure hPa : 1150
Rack travel in m: 13.60...13.90 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 800 Del.quantity : 200.0...213.0) 5th pressure hPa : -Rack travel in m: 10.30...10.60 Spread cm3 : 6.00 1000 : (9.00) START CUT-OUT RATED SPEED 1/min : 270 (290) Speed 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 118...126 1st version Testing: Aneroid pressure h: 1400 Speed rpm : 1050 Del.quantity cm3/ : 194.0...197.0 1000 s: (191.0...200.8) 1st rack travel in: 11.80 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1200 Spread cm3 : 8.001000 s: (12.0) rpm : 0.00...1.00 Speed Aneroid pressure h: 1400 Speed rpm : 800 LOW IDLE 1 Del.quantity cm3/: 236.0...240.0 Control lever 1000 s: (233.0...243.0) position degrees: 66...74 Spread cm3 : 8.00 1000 s: (12.0) Testing: Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 123.0...125.0 Speed rpm : 250 Minimum rack trave: 7.60 Speed rpm: 350 1000 s: (120.0...128.0) Rack travel in mm : 5.80...6.40 cm3 : 8.00Spread 1000 s: (12.0) CONSTANT REGULATION rpm : 350...500 Speed **BREAKAWAY** TORQUE CONTROL Dimension a mm : 1.30 1st version rpm : 1050 2nd speed 1mm rack travel less than Rack travel in m: 12.80...13.00 3rd speed rpm : 800 full load rack tr: 11.80 Rack travel in m: 14.10...14.30 Speed rpm : 1090...1100 Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test Speed rpm : 100 Del.quantity cm3/ : 195.0...215.0 1000 s: (191.0...219.0) 1st version Setting Speed : 600 rpm Pressure hPa : 800 Remarks: Rack travel mm : 13.20...13.40 Measurement \* Increase in control-rod travel with 1/min : 600 Speed respect to setting at least 0.1 mm 1st pressure hPa : 300 Rack travel in m: 10.90...11.10

2nd pressure hPa : 550

Note remarks

Test sheet : MB 14,7 u 4 Edition : 30.04.92 : 01.92 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 926

Injection pump

Pump designation : PE8P120A320LS7840 EP type number : 0 412 528 850

Governor

Governor design: RQ300/1050PA972-9 Governer no. : 0 421 801 632

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 : (5.15...5.35) Prestroke mm

Rack travel in mm : 20.00...21.00

: 8-7-2-6-3-5-Firing order

4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 12.70...12.90

Del.guantity cm3/: 19.1...19.3

100 s: (18.8...19.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 600.0 Rack travel in mm: 4.2...4.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 700

: 191.0...193.0 1000 : (188.0...196.0) Del.quantity

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rom : 600

J03

Rack travel in mm : 20.0 Testina: 1st rack travel in: 12.50 Speed rpm : 1090...1105 2nd rack travel in: 4.00 rom : 1170...1200 Speed 4th rack travel in: 1250 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point wout bumper spring Speed rpm : 300 Rack travel in mm: 6.5 Testina: Speed rpm : 200 Minimum rack trave: 7.90 rpm : 300 Speed Rack travel in mm : 6.20...6.80 Rack travel in mm : 2.00 Speed rpm : 380...420 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom Pressure hPa : 700 Rack travel mm : 12.50...12.70 Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 10.90...11.10 2nd pressure hPa : 440 Rack travel in m: 11.90...12.10 3rd pressure hPa : 920 Rack travel in m: 12.70...12.90 4th pressure hPa :-Rack travel in m: 10.70...11.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1300 rpm : 1050 Speed Del.quantity cm3/: 210.0...213.0 1000 s: (207.0...216.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1300 Speed rpm : 800 Del.quantity cm3/: 212.0...216.0 1000 s: (209.0...219.0)

Spread cm3: 8.00 1000 s: (12.0) Aneroid pressure h: --Speed rpm: 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Spread cm3: 8.00 1000 s: (12.0)

## **BREAKAWAY**

1st version
1mm rack travel less than
full load rack tr: 12.50
Speed rpm : 1090...1105
Remarks:

Note remarks

Test sheet

Edition

: 22.01.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 648 927

Injection pump

Pump designation : PE8P120A320LS7840

EP type number

: 0 412 628 850

Governor

Governor design.

: RQV350...1050PA797

-36

Governer no.

: 0 421 813 984

Customer—spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M442 A

1st version kW

: 250.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Openina

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5,20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 3-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 600

Rack travel in mm : 12.50...12.70

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

Spread

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 6.0...6.6 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed 2nd speed

3rd speed

rpm : 510 rpm : 1050 rpm : 1109 4th speed

5th speed

rpm : 1270

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1030

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 600

Aneroid pressure h: 700

J05

Del.quantity : 188.0...190.0 1000 : (185.0...193.0) : 6.00 cm3Spread 1000 : (9.00)RATED SPEED 1st version Control Lever position degrees: 118...126 Testing: 1st rack travel in: 12.50 Speed rpm : 1090...1100 2nd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1250 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed : 200 rpm Minimum rack trave: 7.90 Speed : 350 rpm Rack travel in mm : 6.20...6.80 Rack travel in mm: 2.00 Speed : 380...420 rom CONSTANT REGULATION : 350...500 Speed rom Areroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm Pressure hPa : 700 Rack travel mm : 12.50...12.70 Measurement Speed 1/min: 600 1st pressure hPa : 250 Rack travel in m: 10.90...11.10 2nd pressure hPa : 440 Rack travel in m: 11.90...12.10 3rd pressure hPa : 900 Rack travel in m: 12.70...12.90 4th pressure hPa : -Rack travel in m: 10.70...11.00 START CUT-OUT

1/min: 270 (290)

FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1300 Speed rpm : 1030 Del.quantity cm3/ : 210.0...213.0 1000 s: (207.0...216.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1300 Speed : 800 rpm Del.quantity cm3/: 212.0...216.0 1000 s: (209.0...219.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 130.0...132.0 1000 s: (127.0...135.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0) Remarks: :

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 26.06.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 928 Injection pump Pump designation: PE8P120A320LS784? EP type number : 0 412 628 863 Governor Governor design. : RQ300/1050PA1030 : 0 421 801 640 Governer no. Customer-spec. information Customer : MERCEDES-BENZ : 0M402 LA Engine 1st version kW : 280.6 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Opening. pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Phasing Spread Spread Speed Speed Spread Speed Testing:

: 5.50...5.60 Prestroke mm (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-4-1 : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 13.40...13.60 Del.quantity cm3/: 23.3...23.5 100 s: (23.0...23.8) cm3 : 0.6100 s: (0.9) 2nd speed rpm : 300.0Rack travel in mm: 5.2...5.8 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9) cm3 : 0.6100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Aneroid pressure h: 1200 Del.quantity : 233.0...235.0 1000 : (230.0...238.0) : 6.00 cm3 1000 : (9.00) RATED SPEED 1st version Setting point: rpm : 600 Rack travel in mm: 20.0

1st rack travel in: 11.80 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1350 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.5 Testing: Speed rpm : 200 Minimum rack trave: 7.60 Speed rpm : 300
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00 rpm : 360...400 Speed TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.80...13.00 2nd speed rpm : 800 Rack travel in m: 13.40...13.60 Aneroid/Altitude Compensator Test 1st version Setting Soezdi nigh : 700 Pressure hPa : 1200 Rack travel mm : 13.40...13.60 Measurement 1/min: 700 Speed 1st pressure hPa : -Rack travel in m: 10.50...10.70 2nd pressure hPa : 350 Rack travel in m: 11.10...11.30 3rd pressure hPa : 750 Rack travel in m: 12.90...13.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed : 1050 rpm Del.quantity cm3/: 206.0...209.0 1000 s: (203.0...212.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -

rpm : 500

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.80 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Dei.quantity cm3/: 45.0...65.0 1000 s: (41.0...69.0) Rack travel in mm : 10.50...10.70

Remarks:

J08

Speed

Note remarks

Test sheet : MB

Edition : 26.06.92

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 648 930

Injection pump

Pund designation : PE3P120A320LS7847 EP type number : 0 412 628 863

Governor

Governor design. : RQ300/1050PA1031-2

Governer no. : 0 421 801 645

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening |

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 : (5.45...5.65) Prestroke mm

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.30...13.50

Del.quantity cm3/: 23.3...23.5

100 s: (23.0...23.8)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 5.2...5.8 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

cm3 : 0.6Spread

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 1200

: 233.0...235.0 Del.quantity

1000 : (230.0...238.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.80 Speed rpm : 1090...1105 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1350 Speed rom : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.5 Testing: Speed rpm : 200 Minimum rack trave: 7.60 rpm : 300 Speed Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 Speed rpm : 370...410 TORQUE CONTROL Dimension a mm : 0.50 Aneroid/Altitude Compensator Test 1st version Setting Speed man : 500 Pressure hPa : 1200 Rack travel mm : 13.40...13.50 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.50...10.70 2nd pressure hPa : 350 Rack travel in m: 11.10...11.30 3rd pressure hPa : 750 Rack travel in m: 12.80...13.00 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 1050 Speed Del.quantity cm3/: 206.0...209.0 1000 s: (203.0...212.0) cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -Speed rom : 500 Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.80 rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 250.0...290.0 1000 s: (246.0...294.0)

Remarks:

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 26.06.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 931 Injection pump Pump designation : PE8P120A320LS7847 EP type number : 0 412 628 863 Governor Governor design. : RQ300/950PA1032-1 Governer no. : 0 421 801 646 Customer-spec, information Customer : MERCEDES-BENZ Engine : 0M402 LA 1st version kW : 280.0 Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder assembly : 1 688 901 105 Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter

Test pressure, bar: 25...27 : 5.50...5.60 Prestroke mm : (5.45...5.65) Rack travel in mm : 20.00...21.00 : 8-7-2-6-3-5-Firing order Phasing : 0-45-90-135-180-225-270-315 : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 8 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 13.50...13.60 Del.quantity cm3/: 23.3...23.5 100 s: (23.0...23.8) Spread cm3 : 0.6100 s: (0.9) rpm : 300.0 2nd speed Rack travel in mm : 5.2...5.8 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9) cm3 : 0.6 Spread 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Aneroid pressure h: 1200 Del.quantity : 233.0...238.0) : 6.00 1000 : (9.00) RATED SPEED 1st version Setting point: : 600 Speed rpm

BEGINNING OF DELIVERY

x Wall thickness

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

: 8.00x2.50x1000

x Length mm

Rack travel in mm: 20.0 Testing: 1st rack travel in: 12.00 Speed rpm : 990...1005 2nd rack travel in: 4.00 Speed rpm : 1065...1095 4th rack travel in: 1350 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rom : 300 Rack travel in mm: 5.5 Testing: rpm : 200 Speed Minimum rack trave: 8.00 Speed rpm : 300
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 360...400 Ameroid/Altitude Compensator Test 1st version Setting Speed : 500 COM hPa : 1200 Pressure : 13.50...13.60 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 10.50...10.70 2nd pressure hPa : 350 Rack travel in m: 11.10...11.30 3rd pressure hPa : 750 Rack travel in m: 12.80...13.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 950 Speed Del.quantity cm3/: 214.0...218.0 1000 s: (211.0...221.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

cm3 : 8.00

1000 s: (12.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 1..00

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 45.0...65.0

1000 s: (41.0...69.0)

Rack travel in mm : 10.50...10.70

Pemarks:

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.50...4.60 Prestroke mm : (4.45...4.65) Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-8-7-2-6-3-Test sheet : LIE Edition : 03.07.92 Replaces Test oil : ISO-4113 Phasina : 0-45-90-135-180-225-Combination no. : 0 402 648 932 270-315 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PE8P120A320LS7849 BASIC SETTING EP type number : 0 412 628 864 Governor 1st speed rpm : 1050Governor design. : RQV300...1050PA1034 Governer no. : 0 421 813 993 Rack travel in mm : 15.00...15.10 Customer-spec. information Del.quantity cm3/: 26.2...26.4 Customer : LIEBHERR 100 s: (25.9...26.7) Engine : D 9308 TI Spread cm3 : 0.51st version kW : 360.0 : 2100 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0Rack travel in mm: 5.1...5.5 Del.quantity cn3/: 1.8...2.4 100 s: (1.5...2.7) Test oil inlet temp. °C : 38...42 Spread cm3 : 0.6Overflow valve 100 s: (1.0) : 1 417 413 025 (3) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder GUIDE SLEEVE TRAVEL assembly : 1 688 901 105 1st speed rpm : 350: 1.70...2.10 travel mm Openina 2nd speed rpm : 405 pressure, bar : 207...210 : 2.40...2.90 travel mm 3rd speed rpm : 550 Orifice plate : 4.20...4.60 travel mm diameter mm : 0,8 4th speed rpm : 780 : 6.30...6.90 travel mm rpm : 1118 5th speed Test lines : 1 680 750 075 : 10.40...10.60 travel mm Outside diameter GUIDE SLEEVE POSITION x Wall thickness Control-lever position x Length mm : 8.00x2.50x1000 Degree: -1 rpm : 1185 (A) Injection pump setting values Rack travel in mm : 12.70...15.30 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values 1st version BEGINNING OF DELIVERY Speed rpm : 1050

Aneroid pressure h: 1500

Test pressure, bar: 25...27

Del.quantity : 262.0...264.0

1000 : (259.0...267.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 103...111

Testing:

1st rack travel in: 14.00

rpm : 1100...1110 Speed

2nd rack travel in: 4.00

Speed rpm : 1200...1230

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1 Control lever

position degrees: 68...76

Testing:

Speed : 250 man Minimum rack trave: 8.50 rpm : 350 Speed

Rack travel in mm : 5.20...5.40

Rack travel in mm : 2.00

: 430...490 Speed rom

CONSTANT REGULATION

rpm : 350...420 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 550 Speed rpm hPa : 1500 Pressure

: 15.00...15.10 Rack travel mm

Measurement

Speed 1/min: 550

1st pressure hPa : -

Rack travel in m: 12.70...12.90

2nd pressure hPa : 1010

Rack travel in m: 14.60...14.70

3rd pressure hPa : 830

Rack travel in m: 13.20...13.40

START CUT-OUT

1/min: 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 550 Del.quantity cm3/ : 218.0...220.0 1000 s: (215.0...223.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

rpm : 1100...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 155.0...175.0

1000 s: (151.0...179.0)

Rack travel in mm : 20.00...21.00

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.50...4.60 : (4.45...4.65) Note remarks Rack travel in mm : 9.00...12.00 : 1-8-7-2-6-3-Firing order 5- 4 Test sheet : LIE Edition : 26.06.92 Replaces Test oil : ISO-4113 Phasing : 0-45-90-135-180-225-Combination no. : 0 402 648 932A 270-315 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation: PE8P120A320LS7849 BASIC SETTING EP type number : 0 412 628 864 Governor 1st speed rpm: 1050 Governor design. : RQV300...1050PA1034 Governer no. : 0 421 813 993 Rack travel in mm: 14.40...14.60 Customer-spec. information Del.quantity cm3/: 26.2...26.4 Customer : LIEBHERR 100 s: (25.9...26.7) Engine : D 9308 TI Spread cm3 : 0.51st version kW : 360.0 : 2100 Rated speed 100 s: (0.9) 2nd speed rpm: 350.0 Rack travel in mm: 5.7...5.9 Del.quantity cm3/: 1.8...2.4 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 100 s: (1.5...2.7) Spread cm3 : 0.6Overflow valve 100 s: (1.0) : 1 417 413 025 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder GUIDE SLEEVE TRAVEL assembly : 1 688 901 105 1st speed rpm : 350 : 1.70...2.10 travel mm Opening . 2nd speed rpm : 405 : 2.40...2.90 : 207...210 pressure, bar travel mm 3rd speed rpm : 550 Orifice plate travel mm : 4.20...4.60 diameter mm : 0,8 4th speed rpm : 780 : 6.30...6.90 travel mm 5th speed rpm : 1118 Test lines : 1 680 750 075 travel mm : 10.40...10.60 Outside diameter GUIDE SLEEVE POSITION x Wall thickness Control-lever position x Length mm : 8.00x2,50x1000 Degree: -1 rpm : 1140 (A) Injection pump setting values Rack travel in mm : 12.20...14.80 Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values

1st version

rpm : 1050

Aneroid pressure h: 1500

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 262.0...264.0

1**000** : (259.0...267.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 103...111

Testing:

1st rack travel in: 13.50

Speed rpm : 1100...1110

2nd rack travel in: 4.00

rpm : 1190...1220 Speed

4th rack travel in: 1300

rpm : 0.00...1.40 Speed

LOW IDLE 1 Control Lever

position degrees: 68...76

Testing:

Speed rom : 250 Minimum rack trave: 10.80 rpm : 350 Speed

Rack travel in mm : 5.70...5.90

Rack travel in mn: 2.00

Speed : 430...490 mom

CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude Compensator Test

1st version

Settina

Speed man : 550 hPa : 1500 Pressure

Rack travel mm : 14.40...14.60

Measurement

1/min: 550 Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.40

2nd pressure hPa : 1130 Rack travel in m: 13.60...13.80

3rd pressure hPa : 870

Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 550 Speed

Del.quantity cm3/: 193.5...195.5

1000 s: (190.5...198.5)

Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

rpm : 1100...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

Rack travel in mm : 20.00...21.00

Remarks:

J16

Note remarks

Test sheet

Edition

: 31.07.92

Peplaces

Test oil

: ISO-4113

Combination no.

: 0 402 648 934

Injection pump

Pump designation : PE8P120A320LS7823

EP type number

: 0 412 628 835

Governor

Governor design.

: RQV350...1050PA866

-21

Coverner no.

: 0 421 813 996

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M442 LA

1st version kW

: 353.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 019

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Lenath mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 8-7- 2- 6- 3- 5-4-1

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

Spread

rpm: 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 23.4...23.7

100 s: (23.1...24.0)

cm3 : 0.5

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm: 5.0...5.6

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

Spread

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.40...1.60 travel mm

2nd speed rpm : 800

: 4.70...5.10 travel mm

3rd speed

rpm : 1100

travel mm 4th speed

: 7.60...8.20 rpm : 1175 : 9.20...9.80

travel mm

Speed

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 13.70...13.90 \* Speed rom : 6004th pressure hPa : 1250 Aneroid pressure h: 900 Rack travel in m: 14.50...14.70 Del.quantity : 234.0...237.0 5th pressure hPa : -1000 : (231.0...240.0) Rack travel in m: 10.10...10.40 cm3 : 5.00 Spread 1000 : (9.00) START CUT-OUT RATED SPEED Speed 1/min: 270 (290) 1st version FUEL DELIVERY CHARACTERISTICS Control Lever position degrees: 115...123 1st version Testina: Aneroid pressure h: 1600 Speed rpm : 1050 Del.quantity cm3/ : 252.0...256.0 1000 s: (249.0...259.0) 1st rack travel in: 13.40 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1170...1200 Speed cm3 : 8.00 Spread 4th rack travel in: 1300 1000 s: (12.0) rom : 0.00...1.00 Speed Aneroid pressure h: 1600 Speed rpm Del.quantity cm3/: 270.0...274.0 1000 s: (267.0...277.0) LOW IDLE 1 Control lever position degrees: 62...70 cm3 : 8.00Spread 1000 s: (12.0) Testina: Aneroid pressure h: 1600 Speed MCC : 250 Speed rpm : 1050 Del.quantity cm3/: 184.0...187.0 \* 1000 s: (181.0...190.0) Minimum rack trave: 7.10 rpm : 350 Rack travel in mm : 5.00...5.60 Spread cm3 : 8.00 1000 s: (12.0) CONSTANT REGULATION Ameroid pressure h: rpm : 350...550 Speed rpm : 500 Speed Del.quantity cm3/: 149.0...151.0 TORQUE CONTROL 1000 s: (146.0...154.0) Dimension a mm : 0.50 cm3 : 8.00 Spread 2nd speed : 1050 1000 s: (12.0) rom Rack travel in m: 14.40...14.60 3rd speed rpm : 800 Rack travel in m: 15.20...15.40 BREAKAWAY Aneroid/Altitude 1st version Compensator Test 1mm rack travel less than full load rack tr: 13.40 1st version Speed rpm : 1090...1100 Setting Speed rpm : 600 STARTING FUEL DELIVERY Pressure hPa : 900 : 13.60...13.80 Rack travel mm Speed : 100 rpm Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) Measurement 1/min: 600 Speed 1st pressure hPa : 350
Rack travel in m: 11.10...11.30
2nd pressure hPa : 500
Rack travel in m: 12.80...13.00 Remarks: \* Increase in control-rod travel with 3rd pressure hPa : 1050 respect to setting at least 0.1 mm

1st version

Note remarks

Test sheet : MB

Edition : 26.06.92

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 648 939

Injection pump

Pump designation : PE8P120A320LS7851

EP type number : 0 412 628 865

Governor

Governor design. : RQV300...1050PA797

-37

Governer no. : 0 421 814 003

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 01/442 LA

1st version kW : 405.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.70...4.80

: (4.65...4.85)
Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 14.40...14.60

Del.quantity cm3/: 28.1...28.3

100 s: (27,8...28,6)

Spread cm3:0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.6...6.2

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread cm3: 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.50...1.00

2nd speed rpm : 575

travel mm : 4.30...4.80

3rd speed rpm : 830

travel mm : 5.90...6.40

4th speed rpm: 1108

travel mm : 8.10...8.60

5th speed rpm : 1190

travel mm : 9.70...10.20

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 12.10...14.70

FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1050 Aneroid pressure h: 1300 tel.quantity : 281.3...286.0) : 6.00 1000 : (9.00) PATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 13.40 Speed rpm : 1090...1105 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1250 rpm : 0.00...1.50 Speed LOW IDLE 1 Control lever position degrees: 78...36 Testing: Speed : 200 rpm Minimum rack trave: 7.20 Speed (mar) : 300 Rack travel in ma : 5.80...6.00 CONSTANT REGULATION Speed rpm : 380...420 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 rom hPa : 1300 Pressure Rack travel mm : 14.40...14.60 Measurement 1/min: 500 Speed 1st pressure hPa :-Rack travel in m: 7.90...8.10 2nd pressure hPa : 500 Rack travel in m: 9.20...9.40 3rd pressure hPa : 1000

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1300 Speed rpm : 600 Del.quantity cm3/: 293.0...296.0 1000 s: (290.0...299.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 131.0...133.0 1000 s: (128.0...136.0) cm3 : 8.00Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 13.40
Speed rpm : 1090...1105
STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 80.0...100.0 1000 s: (76.0...104.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mor : 5.00...5.10 : (4.95...5.15) Note remarks Rack travel in mm : 13.00...14.00 : 10- 9- 4- 1- 8- 7-Firing order Test sheet : MAN 18,2 j 6-3-5-2 Edition : 31.07.92 : 07.90 Replaces Test oil : ISO-4113 Phasina : 0-45-72-117-144-189-Combination no. : 0 402 649 811 216-261-288-333 Tolerance + - ° : 0.50 (0.75) Inteution pump Pump designation : PE10P120A520LS7831 Time to cyl. no. : 10 : 0 412 629 806 EP type number Governor BASIC SETTING Governor design. : RQ300/950PA950 Governer no. : 0 421 801 520 1st speed rpm: 950 Customer-spec, information Rack travel in mm : 13.50...13.60 Customer : MAN Del.quantity cm3/: 22.9...23.1 Engine : D 2840 LF 100 s: (22.6...23.4) 1st version kW : 368.0 Rated speed : 1900 Spread cm3 : 0.5TEST BENCH REQUIREMENTS 100 s: (0.9) rpm : 300.0 Test oil 2nd speed inlet temp. °C : 38...42 Rack travel in mm : 5.0...5.4 Del. quantity cm3/: 1.7...2.3 Overflow valve 100 s: (1.4...2.6) : 1 417 413 025 cm3 : 0.8 Spread 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Test nozzle holder Control-lever position : 1 688 901 019 assembly Degree: -2 rpm : 600 Opening. Rack travel in mm : 19.20...20.80 pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate diameter mm : 0,8 1st version Speed rpm : 950 Aneroid pressure h: 1000 Test Lines : 1 680 750 075 : 229.0...231.0 Del.quantity 1000 : (226.0...234.0) Outside diameter : 5.00 Spread cm3 x Wall thickness 1000 : (9.00) x Length mm : 8.00x2.50x1000 RATED SPEED (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. per values Setting point: Speed rpm : 600 BEGINNING OF DELIVERY Rack travel in mm: 20.0 Test pressure, bar: 25...27 Testing:

1st rack travel in: 12.50

rpm : 995...1010 Speed

2nd rack travel in: 4.00

rpm : 1040...1070 Speed

4th rack travel in: 1150

rom : 3.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 5.2

Testing:

Speed rpm : 100 Minimum rack trave: 6.70

Speed rpm : 300

Rack travel in mm : 5.10...5.30

Rack travel in mm: 2.00

Speed : 370...410 COM

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 950

Rack travel in m: 13.70...13.80

2nd speed rpm : 600

Rack travel in m: 13.70...13.90

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 חמרו Pressure hPa : 1000

Rack travel mm : 13.50...13.60

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 10.70...10.90

2nd pressure hPa : 200

Rack travel in m: 11.10...11.20

3rd pressure hPa : 500

Rack travel in m: 12.80...13.10

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600 Del.quantity cm3/: 225.0...231.0 1000 s: (222.0...234.0)

Aneroid pressure h: -

Speed rom

Del.quantity cm3/: 151.0...153.0

1000 s: (148,0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 995...1010

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 170.0...190.0

1000 s: (166.0...194.0)

LOW IDLE

Speed rpm

Rack travel in mm : 5.00...5.40

Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MAN-NR. 3-7014

Setting and blocking of pointer of start-of-delivery sensor on cyl. 10

start of delivery

Note remarks

Test sheet : MAN

Edition

Replaces

: 26.06.92

Test oil : ISO-4113

Combination no. : 0 402 649 811B

Injection pump

Pump designation : PE10P120A520LS7831

EP type number

: 0 412 629 806

Governor

Governor design. : RQ300/950PA950

Governer no.

: 0 421 801 520

Cust. part no.

: 3-7092

Customer-spec, information

Customer

: MAN

Engine

: D 2840 LF

1st version kW

: 368.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 13.00...14.00

Firing order

: 19-9-4-1-8-

Phasing : 0-45-72-117-144-189-

216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyt. no. : 10

BASIC SETTING

1st speed rpm: 950

Rack travel in mm : 13.60...13.70

Del.quaritity cm3/: 23.2...23.4

100 s: (22.9...23.7)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm: 4.8...5.2

Del.quantity cm3/: 1.2...1.8 100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Aneroid pressure h: 1000

: 232.0...234.0 Deliquantity

1000 : (229.0...237.0) cm3 : 5.00

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm Speed : 600

Rack travel in mm: 20.0

Testing:

1st rack travel in: 12.50

Speed rpm : 995...1010

2nd rack travel in: 4.00

Speed rpm : 1040...1070

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rom : 300 Rack travel in mm: 5.0

Testing:

rpm : 100 Speed

Minimum rack trave: 6.70

Speed rpm : 300 Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00 Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 950

Rack travel in m: 13.70...13.80

2nd speed rpm : 600

Rack travel in m: 13.70...13.90

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500

hPa : 1000 Pressure

Rack travel mm : 13.60...13.70

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.80...11.00 2nd pressure hPa : 200 Rack travel in m: 11.20...11.30

3rd pressure hPa : 500

Rack travel in m: 12.90...13.20

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 Speed rpm : 600

Del.quantity cm3/: 228.0...234.0 1000 s: (225.0...237.0) Ameroid pressure h: rpm : 500

Speed

Del.quantity cm3/: 151.0...153.0

1000 s: (148.0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.50

rpm : 995...1010 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 4.80...5.20

Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 10

start of delivery

Note remarks

Test sheet : MAN 18,2 k Edition : 31.07.92 Replaces : 06.90 Test oil : ISO-4113

Combination no. : 0 402 649 812

Injection pump

Pump designation : PE10P120A520LS7831

EP type number : 0 412 629 806

Governor

Governor design, : RQV300...950PA949 : 0 421 813 855 Governer no.

Customer-spec, information Customer : MAN

Engine : D 2840 LF

1st version kW : 368.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 625

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15)

Rack travel in mm : 13.00...14.00

Firing order : 10-9-4-1-- 6- 3- 5- 2

: 0-45-72-117-144-189-216-261-288-333 Phasing

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rom: 950

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 5.0...5.4 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

travel mm : 10.10...10.30

2nd speed rpm : 300

travel mm : 1.20...1.40

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 1200

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1000 Speed

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950 Aneroid pressure h: 1000 Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testina:

1st rack travel in: 12.50 rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1045...1075 Speed

4th rack travel in: 1150

rom : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 74...82

Testing:

Speed : 100 rpm Minimum rack trave: 6.70 rpm : 300 Speed

Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

rpm : 310...430 Speed

Aneroid/Altitude Compensator Test

1st version Settina

Speed : 500 rpm Pressure hPa : 1000

: 13.50...13.60 Rack travel mm

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.70...10.90

2nd pressure hPa : 200

Rack travel in m: 11.10...11.20

3rd pressure hPa : 500

Rack travel in m: 12.80...13.10

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed : 600 rpm Del.quantity cm3/: 225.0...231.0

1000 s: (222.0...234.0)

Aneroid pressure h: -

Speed rpm

Del.quantity cm3/: 151.0...153.0 1000 s: (148.0...156.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 990...1000

STARTING FUEL DELIVERY

rpm : 100 Spe€.d

Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 5.00...5.40

Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 3-7015

Setting and blocking of pointer of start-of-delivery sensor on cyl. 10

start of delivery

Note remarks

: MAN Test sheet

Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 649 812B

Injection pump

Pump designation : PE10P120A520LS7831

: 0 412 629 806 EP type number

Governor

Governor design. : RQV300...950PA949

: 0 421 813 855 Governer no.

Cust. part no. : 3-7093

Customer-spec, information

: MAN Customer

Engine : D 2840 LF

1st version kW : 368.0

: 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00X2.50X1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15) Rack travel in mm : 13.00...14.00

Firing order : 16-9-4-1-8-

- 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SEITING

1st speed rpm: 950

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 23.2...23.4

100 s: (22.9...23.7)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 4.8...5.2 bel.quantity cm3/: 1.2...1.8

100 s: (0.9...2.1)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

: 10.10...10.30 travel mm

2nd speed rpm : 300

travel mm : 1.20...1.40

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 1200

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1000 Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Aneroid pressure h: 1000 : 232.0...234.0 Del.quantity 1000 : (229.0...237.0) : 5.00 Spread cm3 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 117...125 Testina: 1st rack travel in: 12.50 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1030...1060 Speed rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 58...66 Testing: Speed rpm : 100 Minimum rack trave: 6.70 rpm : 300 Speed Rack travel in mm : 4.90...5.10 CONSTANT REGULATION Speed rpm : 310...430 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 1000 Pressure Rack travel mm : 13.60...13.70 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.80...11.00 2nd pressure hPa : 200 Rack travel in m: 11.20...11.30 3rd pressure hPa : 500
Rack travel in m: 12.80...13.10 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1000 rpm Del.quantity cm3/: 225.0...231.0 1000 s: (222.0...234.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 151.0...153.0 1000 s: (148.0...156.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 990...1000 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 12.0...18.0 1000 s: (9.0...21.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 10 start of delivery

1st version

K01

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.00...5.10 Prestroke mm (4.95...5.15)Note remarks Rack travel in mm : 13.00...14.00 : 10- 9- 4- 1- - 6- 3- 5-Firing order Test sheet : MAN Edition : 31.07.92 Replaces : ISO-4113 Test oil Phasing : 0-45-72-117-144-189-Combination no. : 0 402 649 814 216-261-288-333 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation : PE10P120A520LS7831 Time to cyl. no. : 10 EP type number : 0 412 629 806 BASIC SETTING Governor Governor design. : RQ300/950PA950-1 : 0 421 801 651 rpm: 950 Governer no. 1st speed Rack travel in mm : 13.30...13.40 Customer-spec, information Customer : MAN Del.quantity cm3/: 22.3...22.5 Engine : D 2840 LF 06 100 s: (22.0...22.8) : 368.0 1st version kW : 1900 Rated speed Spread cm3 : 0.5TEST BENCH REQUIREMENTS 100 s: (0.9) rpm : 300.0Test oil 2nd speed inlet temp. °C : 38...42 Rack travel in mm: 4.9...5.3 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Overflow valve : 1 417 413 025 cm3 : 0.8 Spread 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Test nozzle holder Control-lever position : 1 688 901 019 assembly Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 Openina pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 rpm : 950 Speed Aneroid pressure h: 1000 Test lines : 1 680 750 075 Del.quantity : 223.0...225.0 1000 : (220.0...228.0) Outside diameter cm3 : 5.00 Spread : (9.00) x Wall thickness 1000 x Length mm : 8.00x2.50x1000 RATED SPEED (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. per values \_\_\_\_ Setting point: : 600 Speed rpm BEGINNING OF DELIVERY Rack travel in mm: 20.0 Test pressure, bar: 25...27 Testing:

1st rack travel in: 12.30 rpm : 995...1010 Speed 2nd rack travel in: 4.00 rpm : 1040...1070 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 249...257 Testina: Speed rpm : 200 Minimum rack trave: 6.60 rpm : 300 Speed Rack travel in mm : 5.00...5.20 Rack travel in mm: 2.00 Speed rpm : 370...410 TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 13.30...13.40 2nd speed rpm : 600 Rack travel in m: 13.30...13.50 Aneroid/Altitude Compensator Test 1st version Settina Speed rom : 500 hPa : 1000 Pressure Rack travel mm : 13.30...13.40 Measurement 1/min : 500Speed 1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 430 Rack travel in m: 10.50...10.60 3rd pressure hPa : 700 Rack travel in m: 12.00...12.40 START CUT-OUT 1/min : 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 rpm : 600 Speed Del.quantity cm3/: 219.0...225.0 1000 s: (216.0...228.0)

Speed rpm : 500 Del.quantity cm3/: 146.0...148.0 1000 s: (143.0...151.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.30 rpm : 995...1010 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 14.0...20.0 1000 s: (11.0...23.0) Spread cm3 : 8.001000 s: (12.00) Remarks: : MAN-NR. 3-7222 Setting and blocking of pointer of

Setting and blocking of pointer of start-of-delivery sensor on cyl. 10 start of delivery

K03

Aneroid pressure h: -

Note remarks

Test sheet

: MAN

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 649 815

Injection pump

Pump designation : PE10P120A520LS7831

EP type number

: 0 412 629 806

Governor

Governor design. : RQV300...950PA949-1

: 0 421 813 998 Governer no.

Customer

Customer-spec. information : MAN

Engine

: D 2840 LF 06

1st version kW

Rated speed

: 368.0 : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina .

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 13.00...14.00

Firing order

: 10-9-4- 1- 8- 7 -6-3-5-2

Phasing

: 0-45-72-117-144-189-

216-261-288-333

Tolerance + - °

: 0.50 (0.75)

: 10 Time to cyl. no.

BASIC SETTING

1st speed

rpm: 950

Rack travel in mm : 13.30...13.40

Del.guantity cm3/: 22.3...22.5

100 s: (22.0...22.8)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 4.9...5.3

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 995

10.10...10.30 travel mm

2nd speed

rpm : 300

travel mm 3rd speed

travel mm

: 1.20...1.40

rpm : 800

: 6.40...6.80

rpm : 1200

4th speed travel mm

: 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1060

Rack travel in mm : 11.00...13.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 950

Aneroid pressure h: 1000

: 223.0...225.0 Del.quantity 1000 : (220.0...228.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 117...125 Testing: 1st rack travel in: 12.30 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1045...1075 Speed 4th rack travel in: 1150 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 75...83 Testing: Speed : 200 man Minimum rack trave: 6.60 rpm : 300 Speed Rack travel in mm : 5.00...5.20 CONSTANT REGULATION rpm : 280...400 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 1000 Pressure : 13.30...13.40 Rack travel mm Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 430 Rack travel in m: 10.50...10.60 3rd pressure hPa : 700 Rack travel in m: 12.00...12.30 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1000 Speed rpm : 600 Del.quantity cm3/ : 219.0...225.0 1000 s: (216.0...228.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 146.0...148.0 1000 s: (143.0...151.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.30 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 14.0...20.0 1000 s: (11.0...23.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : MAN-NR. 3-7223 Setting and blocking of pointer of start-of-delivery sensor on cyl. 10 start of delivery

K05

1st version

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN : 03.07.92 Edition Replaces Test oil : ISO-4113 Combination no. : 0 402 649 816 Injection pump Pump designation : PE10P120A520LS7853 EP type number : 0 412 629 810 Governor : RQV300...1150PA1039-Governor design. 2K : 0 421 815 316 Governer no. Customer-spec. information Customer : MAN : D 2840 LXE Engine : 603.0 1st version kW Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening | : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 10- 9- 4- 1- 8- 7 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-Phasing : 216-261-288-333 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 29.9...30.1

100 s: (29.6...30.4)

Spread cm3 : 0.5 100 s: (0.9)

2nd speed rpm : 500 Rack travel in mm : 8.8...9.0 Del.quantity cm3/ : 14.9...15.1 100 s: (14.6...15.4)

Spread cm3 : 0.8 100 s: (1.2) 3rd speed rpm : 300

3rd speed rpm : 300
Rack travel in mm : 7.30...7.50
Del.quantity cm3/ : 5.2...6.0 \*\*
100 s: (-)

Spread cm3 : -100 s: (-)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL
1st speed rpm : 300
travel mm : 2.00...2.20
2nd speed rpm : 450

travel mm : 4.00...4.40

3rd speed rpm : 800

travel mm : 6.70...7.10 4th speed rpm : 1200

travel mm : 10.30...10.50

5th speed rpm : 1400 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position Degree: -1

K06

START CUT-OUT Speed rpm : 1280 Rack travel in mm : 11.20...13.80 1/min : 200 (220) Speed FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 Speed Aneroid pressure h: 1300 1st version 299.0...301.0 1000 : (296.0...304.0) Del.quantity Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 149.0...151.0 1000 s: (146.0...154.0) Spread cm3 : 5.00 1000 : (9.00) Spread cm3 : 8.00 1000 s: (12.0) RATED SPEED 1st version **BREAKAWAY** Control lever position degrees: 115...123 1st version 1mm rack travel less than Testina: 1st rack travel in: 12.50 rpm : 1190...1200 Speed full load rack tr: 12.50 2nd rack travel in: 4.00 rpm : 1190...1200 Speed rpm : 1285...1315 Speed 4th rack travel in: 1450 STARTING FUEL DELIVERY rpm : 0.00...1.00Speed LOW IDLE 1 Speed rpm : 100 Del.quantity cm3/: 100.0...120.0\*\* Control lever 1000 s: (-) position degrees: 70...78 Testing: Speed rpm : 100 Del.quantity cm3/ : 0 \*Speed rpm : 200 1000 s: (-) Minimum rack trave: 6.70 Rack travel in mm : 17.5...21.0 rpm Rack travel in mm : 5.10...5.30 HIGH IDLE CONSTANT REGULATION rpm : 270...390 Speed 1st version Speed rpm : 500 Rack travel in mm : 0.00...7.00 Aneroid/Altitude Del.quantity cm3/: 0 \* Compensator Test 1000 s: (-) 1st version 2nd version rpm : 500 Settina Rack travel in mm : 0.00...7.50 Speed rom : 900 Del.quantity cm3/: 0...50.0 1000 s: (-) hPa : 1300 Pressure Rack travel mm : 13.50...13.60 Measurement 3rd version 1/min: 900 Speed Speed rpm : 500 Rack travel in mm : 8.50...8.70 Del.quantity cm3/: 125.0... 1000 s: (-) 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 200 Rack travel in m: 9.30...9.40 LOW IDLE 3rd pressure hPa : 800 Speed rpm: 300 Rack travel in mm: 7.30...7.50 Rack travel in m: 12.10...12.50

Del.quantity cm3/ : 52.0...60.0 \*\* 1000 s: (-)

Remarks:

: MAN-NR. 3-7225

\* applies to cylinders 1, 2, 3, 7 and 9
\*\* applies for cylinders 4, 5, 6, 8 and 10

APPLICATION

Ship

Note remarks

Test sheet

Edition

: 31.07.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 670 800

Injection pump

Pump designation : PE12P12OA320LS7850

EP type number

: 0 412 620 833

Governor

Governor design. : RSV350...750P0A825

Governer no.

: 0 421 833 221

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM 444 LA

1st version kW

: 389.0

Rated speed

: 1500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

: 1 688 901 019 assembly

Openina

pressure, bar

: 207...210

Test lines

: 1 680 750 067

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00 Firing order

: 12- 1- 5- 9- 8- 3-

4- 11- 10- 2- 6- 7

Phasing

: 0-45-60-105-120-165-180-225-240-285-300-

Phasina

: 345

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed

rpm: 700

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 21.0...21.2

100 s: (20.7...21.5)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 350.0

2nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

Speed

rpm : 700

: 210.0...212.0 Del.quantity

1000 : (207.0...215.0)

cm3

: 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 21...29

Testing:

1st rack travel in: 12.10

rpm : 750...755

Speed

2nd rack travel in: 4.00 rpm : 775...788 Speed 4th rack travel in: 900 rpm : 0.30...1.00 Speed LOW IDLE 1 Control lever position degrees: 9...17 Setting point w/out bumper spring rpm : 350 Rack travel in mm : 5.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 350 Speed Rack travel in mm : 5.40...5.60 SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 FUEL DELIVERY CHARACTERISTICS 1st version : 650 Speed rpm Del.quantity cm3/: 209.0...213.0 1000 s: (206.0...216.0) Spread cm3 : 8.00 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.10 rpm : 750...755 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 210.0...230.0 1000 s: (206.0...234.0)

Remarks:

Observe VDT-I-420/120

APPLICATION

Rail car

#### Note remarks

Test sheet : MB 22,0 d
Edition : 07.08.92
Replaces : 06.04.90
Test oil : ISO-4113

Combination no. : 0 402 670 807

Injection pump

Pump designation: PE12P12OA320LS7814-1

EP type number : 0 412 620 819

Governor

Governor design. : RSV375...1050P0A535

\_3

Governer no. : 0 421 833 328

Customer-spec. information

Customer : MERCEDES—BENZ

Engine : OM 444 LA

1st version kW : 588.0 Rated speed : 2100

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00X1.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 19.00...21.00

Firing order : 12-1-5-9-8-3-

4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-

180-225-240-285-300-

345

Tolerance  $+ - ^{\circ}$  : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 26.2...26.5

100 s: (25.9...26.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 375.0

Rack travel in mm : 5.1...5.4 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3
Speed rpm: 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 650 Aneroid pressure h: 1100

Del.quantity : 262.0...265.0

1000 : (259.0...268.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever position degrees: 96...104 Testina: 1st rack travel in: 12.90 rpm : 1070...1080 Speed 2nd rack travel in: 4.00 Speed rpm : 1150...1168 4th rack travel in: 1400 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring npm: : 375 Rack travel in mm: 5.2 Testing: Speed : 100 rpm -Minimum rack trave: 8.00 Speed rpm : 375 Rack travel in mm : 5.10...5.40 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version rpm : 1030 1st speed Rack travel in m: 13.70...13.90 rpm : 950 2nd speed Rack travel in m: 14.20...14.40 3rd speed rpm : 850 Rack travel in m: 14.40...14.60 Aneroid/Altitude Compensator Test 1st version Settina Speed : 600 rom Pressure hPa : 1050 Rack travel mm : 13.90...14.10 Measurement 1/min: 600 Speed 1st pressure hPa : 400 Rack travel in m: 9.30...9.50 2nd pressure hPa : 650 Rack travel in m: 12.10...12.30 3rd pressure hPa : 1370 Rack travel in m: 14.10...14.30 4th pressure hPa : -

Rack travel in m: 8.20...8.60

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1800 rpm : 1030 Del.quantity cm3/: 261.0...264.0 1000 s: (258.0...267.0) Spread cm3 : 8.00 1000 s: (12.) Aneroid pressure h: 1800 Speed rpm : 750
Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0) cm3 : 8.00Spread 1000 s: (12.00 rpm : 500Speed Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0) cm3 : 8.00 Spread 1000 s: (12.00

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.90 Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0)

Remarks:

On activation of the starting solenoid, the start position must be reached.

Observe VDT-I-420/120

Note remarks

Test sheet : MB 22,0 d
Edition : 06.04.90
Replaces : 13.12.89
Test oil : ISO-4113

Combination no. : 0 402 670 807

Injection pump

Pump designation : PE12P12DA32DLS7814-1 EP type number : 0 412 620 819

Governor

Governor design. : RSV375..1050P0A535-3

Governer no. : 0 421 833 328

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 588.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 150...170

Test nozzle holder

assembly : 1 688 901 019

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95)

Rack travel in mm: 19.00...21.00

Firing order : 12-1-5-9-8-3-

4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-

180-225-240-285-300-

345

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm: 650

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 26.2...26.5

100 s: (25.9...26.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 375.0 Rack travel in mm : 5.1...5.4

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

peed rpm: 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650 Aneroid pressure h: 1100

Del.quantity : 262.0...265.0

1000 : (259.0...268.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testina: 1st rack travel in: 12.90 rpm : 1070...1080 Speed 2nd rack travel in: 4.00 Speed rpm : 1160...1190 4th rack travel in: 1400 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring rpm : 375 Rack travel in mm: 5.2 Testing: Speed rpm : 100 Minimum rack trave: 8.00 : 375 rpm Rack travel in mm : 5.10...5.40 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1030 Rack travel in m: 13.70...13.90 rpm : 950 2nd speed Rack travel in m: 14.20...14.40 3rd speed rpm : 850 Rack travel in m: 14.40...14.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom hPa : 1050 Pressure Rack travel mm : 13.90...14.10 Measurement 1/min: 600 Speed 1st pressure hPa : 400 Rack travel in m: 9.30...9.50 2nd pressure hPa : 650 Rack travel in m: 12.10...12.30 3rd pressure hPa : 1370 Rack travel in m: 14.10...14.30 4th pressure hPa : -Rack travel in m: 8.20...8.60 FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1800 : 1030 rpm Del.quantity cm3/: 261.0...264.0 1000 s: (258.0...267.0) cm3 : 8.00 Spread 1000 s: (12.) Aneroid pressure h: 1800 Speed rpm : 750 Del.quantity cm3/ : 279.0...282.0 1000 s: (276.0...285.0) cm3 : 8.00 Spread 1000 s: (12.00 : 500 Speed rom Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0) cm3 : 8.00 Spread 1000 s: (12.00

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.90 Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0)

Remarks:

On activation of the starting solenoid, the start position must be reached.

Observe VDT-I-420/120

1st version

Note remarks

Test sheet

: MB

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 676 812

Injection pump

Pump designation: PE6P120A320LS7808-3

EP type number

: 0 412 626 870

Governor .

Governor design.

: RSV425...1050P0A535-

Governer no.

: 0 421 833 378

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM 441 LA

1st version kW

: 249.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 019

Opening |

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.60x2.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rom: 600

Rack travel in mm : 14.20...14.40

Del.quantity cm3/: 22.0...22.2

100 s: (21.7...22.5)

Spread

Spread

cm3 : 0.6

100 s: (0.9)

rpm : 425.0 2nd speed

Rack travel in mm: 4.7...5.3 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

rpm : 600

Aneroid pressure h: 900

Del.quantity

: 220.0...222.0 1000 : (217.0...225.0)

cm3

: 6.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 92...100

K15

Testing: 1st rack travel in: 14.00 rpm : 1070...1080 Speed 2nd rack travel in: 4.00 rpm : 1135...1153 Speed 4th rack travel in: 1300 Speed rpm : 0.30...1.40LOW IDLE 1 Control Lever position degrees: 69...77 Setting point w/out bumper spring Speed rpm : 425 Rack travel in mm: 5.00 Testina: Speed man : 100 Minimum rack trave: 19.50 Speed : 425 rpm Rack travel in mm : 4.90...5.10 Rack travel in mm: 2.00 Speed : 430...490 rom SET IDLE AUXILIARY SPRING Rack travel in mm: 2.00 TORQUE CONTROL 2nd speed rpm : 1030 Rack travel in m: 14.90...15.10 3rd speed rpm : 800 Rack travel in m: 15.30...15.50 Aneroid/Altitude Compensator Test 1st version Settina Speed : 600 rpm Pressure hPa : 900 Rack travel mm : 14.20...14.40 Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 10.30...10.50 2nd pressure hPa : 600 Rack travel in m: 13.50...13.70 3rd pressure hPa : 1250 Rack travel in m: 14.40...14.60 4th pressure hPa : 1350 Rack travel in m: 14.80...15.00 5th pressure hPa : -Rack travel in m: 9.50...9.80 FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1500 Speed rpm: 1030 Del.quantity cm3/: 242.0...246.0 1000 s: (239.0...249.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1500 Speed : 800 rom Del.quantity cm3/: 248.0...252.0 1000 s: (245.0...255.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 145.0...147.0 1000 s: (142.0...150.0) Spread cm3 : 8.001000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.00 Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 240.0...260.0

1000 s: (236.0...264.0)

Remarks:

Observe VDT-I-420/120

1st version

Note remarks

Test sheet

: MAN

Edition

: 31.07.92

: 02.92

Replaces Test oil

: ISO-4113

Combination no. : 0 402 735 804

Injection pump

Pump designation : PES5P120A720/3LS7250

EP type number

: 0 412 725 809

Governor

Governor design.

: RQV325...1000PA962-5

: MAN

Governer no.

: 0 421 815 300

Customer

Customer-spec. information

Engine

: D2865LF03/LU03

1st version kW Rated speed

: 235.0 : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Openina

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 15.00...16.00

Firing order

: 1-3-5-4-2

Phasing

: 0-72-144-216-288

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 5

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60

& maximum rack tra: 15.0...16.0

Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed

rpm: 900

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 26.2...26.4

100 s: (25.9...26.7)

Spread

cm3 : 0.6

100 s: (-)

rpm : 350.0 2nd speed

Rack travel in mm: 4.8...5.2

Del.quantity cm3/: 4.7...5.3

100 s: (4.4...5.6)

Spread

cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1050

travel mm

: 8.80...9.00

2nd speed rpm

: 325

travel mm

: 2.40...2.60 man

3rd speed

: 520

travel mm

: 4.30...4.70 : 800

4th speed travel mm

rpm

5.90...6.30 : 1350

5th speed

rpm travel mm

: 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed

rpm : 1140

K17

Rack travel in mm : 9.30...13.30 1st pressure hPa : -Rack travel in m: 8.40...8.60 FULL LOAD DELIV. AT FULL LOAD STOP 2nd pressure hPa : 170 Rack travel in m: 8.80...8.90 1st version Speed rpm : 900 3rd pressure hPa : 600 Aneroid pressure h: 1200 Rack travel in m: 11.40...11.70 Del.quantity : 262.0...264.0 1000 : (259.0...267.0) START CUT-OUT cm3 : 6.00 Spread 1/min : 290 (310) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 284...292 1st version Aneroid pressure h: 1200 rpm : 1000 Testing: Speed 1st rack travel in: 11.30 Del.quantity cm3/: 245.0...251.0 rpm : 1040...1050 1000 s: (242.0...254.0) Speed Aneroid pressure h: 1200 2nd rack travel in: 4.00 Speed rpm : 1125...1155 Speed rom : 650 Del.quantity cm3/: 264.0...270.0 4th rack travel in: 1250 1000 s: (261.0...273.0) rom : 0.00...1.00Speed Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 159.0...161.0
1000 s: (156.0...164.0) LOW IDLE 1 Control lever position degrees: 239...247 Testing: Speed : 250 BREAKAWAY rom Minimum rack trave: 6.50 1st version rom : 350 Rack travel in mm : 4.90...5.10 1mm rack travel less than CONSTANT REGULATION full load rack tr: 11.30 rpm : 340...450rpm : 1040...1050 Speed Speed TORQUE CONTROL STARTING FUEL DELIVERY Dimension a mm : ? Torque control curve - 1st version rpm : 900 1st speed : 100 Speed rpm Rack travel in m: 12.50...12.60 Del.quantity cm3/: 180.0...200.0 2nd speed rpm : 1000 1000 s: (176.0...204.0) Rack travel in m: 12.20...12.40 3rd speed rpm : 650 LOW IDLE Rack travel in m: 11.90...12.10 Speed rpm : 350 Rack travel in mm : 4.80...5.20 Aneroid/Altitude Del.quantity cm3/: 47.0...53.0 1000 s: (44.0...56.0) Compensator Test cm3 : 10.00 Spread 1st version 1000 s: (14.00) Setting Speed : 900 rom Remarks: hPa : 1200 : MAN-NR. 3-7200 Pressure : 12.50...12.60 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 Measurement 1/min: 900

start of delivery

K18

Speed



BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN : 31.07.92 Edition Replaces : 02.92 : ISO-4113 Test oil Combination no. : 0 402 735 805 Injection pump Pump designation : PES5P120A720/3L\$7250 EP type number : 0 412 725 809 Governor Governor design. : RQV325...1000PA962-6 Governer no. : 0 421 815 301 Customer-spec. information Customer : MAN Engine : D2865LF06/LU06 : 235.0 1st version kW Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina ( pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 089 Outside diameter x Wall thickness : 8.00x2.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

: (4.75...4.95) Rack travel in mm : 15.00...16.00 : 1-3-5-4-2 Firing order Phasing : 0-72-144-216-288 Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 5 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25 BASIC SETTING rpm: 900 1st speed Rack travel in mm : 12.40...12.50 Del.quantity cm3/: 26.0...26.2 100 s: (25.7...26.5) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 350.0Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 4.7...5.3 100 s: (4.4...5.6) Spread cm3 : 1.0100 s: (1.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1050: 8.70...8.90 travel mm 2nd speed rpm : 325 : 2.40...2.60 travel mm 3rd speed rpm : 520 : 4.20...4.80 travel mm 4th speed rpm : 810 : 6.00...6.40 travel mm rpm : 1350 5th speed : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1140 Speed

Prestroke mm

: 4.80...4.90

Rack travel in mm : 9.20...13.20 Measurement FULL LOAD DELIV. AT FULL LOAD STOP 1/min: 900 Speed 1st version 1st pressure hPa : -Speed rpm : 900 Rack travel in m: 8.30...8.50 Aneroid pressure h: 1200 2nd pressure hPa : 170 Del.quantity Rack travel in m: 8.70...8.80 : 260.0...262.0 1000 : (257.0...265.0) 3rd pressure hPa : 600 cm3 : 5.00 1000 : (9.00) Rack travel in m: 11.30...11.60 Spread START CUT-OUT RATED SPEED Speed 1/min: 290 (310) 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 284...292 Testing: 1st version 1st rack travel in: 11.20 Aneroid pressure h: 1200 Speed rpm : 1040...1050 Speed rpm : 1000 Del.quantity cm3/: 243.0...249.0 1000 s: (240.0...252.0) 2nd rack travel in: 4.00 rpm : 1125...1155 Speed 4th rack travel in: 1250 Aneroid pressure h: 1200 rpm : 0.00...1.00Speed Speed rpm : 650 Del.quantity cm3/: 270 0...276.0 LOW IDLE 1 1000 s: (267.0...279.0) Control lever Aneroid pressure h: rpm : 500 position degrees: 239...247 Speed Del.quantity cm3/: 159.0...161.0 1000 s: (156.0...164.0) Testina: rpm : 250 Speed Minimum rack trave: 6.50 rpm : 350 Speed **BREAKAWAY** Rack travel in mm : 4.90...5.10 1st version CONSTANT REGULATION 1mm rack travel less than Speed rpm : 340...450 full load rack tr: 11.20 rpm : 1040...1050 TORQUE CONTROL Speed Dimension a mm : ? Torque control curve - 1st version STARTING FUEL DELIVERY rpm : 900 1st speed Rack travel in m: 12.40...12.50 2nd speed rpm : 1000 : 100 rpm Rack travel in m: 12.10...12.30 Del.quantity cm3/: 180.0...200.0 3rd speed rpm : 650 1000 s: (176.0...204.0) Rack travel in m: 12.00...12.20 4th speed rpm : 400 LOW IDLE Rack travel in m: 11.10...11.40 Speed rpm : 350 Aneroid/Altitude Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 47.0...53.0 Compensator Test 1000 s: (44.0...56.0) cm3 : 10.00 Spread 1st version 1000 s: (14.00) Setting Speed rom : 900 Remarks: hPa : 1200 : MAN-NR. 3-7202 Pressure

Rack travel mm : 12.40...12.50

Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

Note remarks

Test sheet : MAN 10,0 f
Edition : 31.07.92
Replaces : 01.92
Test oil : ISO-4113

Combination no. : 0 402 735 806

Injection pump

Pump designation : PES5P120A720/3LS7250

EP type number : 0 412 725 809

Governor

Governor design. : RQV325...1000PA960-8

K

Governer no. : 0 421 815 308

Customer—spec. information Customer : MAN

Engine : D2865LF03

1st version kW : 235.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet remp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 15.00...16.00 Firing order : 1-3-5-4-2

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 5

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 26.2...26.4

100 s: (25.9...26.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0 Rack travel in mm : 4.8...5.2 Del.quantity cm3/ : 4.7...5.3

100 s: (4.4...5.6)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1055

travel mm : 10.40...10.60

2nd speed rpm : 325

travel mm : 2.40...2.60

3rd speed rpm : 500

travel mm : 3.40...4.00

4th speed rpm : 750

travel mm : 6.80...7.20 5th speed rpm : 1350

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 9.10...13.10 1/min: 900 Speed FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -Rack travel in m: 8.20...8.40 2nd pressure hPa : 170 1st version rpm : 900 Rack travel in m: 8.60...8.70 Speed Aneroid pressure h: 1200 3rd pressure hPa : 600 Del.quantity : 262.0...267.0) Rack travel in m: 11.30...11.60 cm3 : 5.00 1000 : (9.00) START CUT-OUT Spread Speed 1/min: 270 (290) RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 293...301 1st version Aneroid pressure h: 1200 rpm : 1000 Testina: Speed Del.quantity cm3/: 245.0...251.0 1st rack travel in: 11.10 1000 s: (242.0...254.0) Aneroid pressure h: 1200 rpm : 1040...1050 Speed 2nd ack travel in: 4.00 rpm : 1125...1155 Speed Speed rpm : 650 4th rack travel in: 1250 Del.quantity cm3/: 264.0...270.0 rpm : 0.00...1.001000 s: (261.0...273.0) Speed Aneroid pressure h: rpm : 500 LOW IDLE 1 Speed Del.quantity cm3/: 159.0...161.0 Control Lever position degrees: 248...256 1000 s: (156.0...164.0) Testina: : 225 Speed **BREAKAWAY** rom Minimum rack trave: 6.50 : 325 Speed 1st version rpm Rack travel in mm : 4.90...5.10 1mm rack travel less than full load rack tr: 11.10 CONSTANT REGULATION rpm : 340...450 rpm : 1040...1050 Speed Speed TORQUE CONTROL STARTING FUEL DELIVERY Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 900
Rack travel in m: 12.30...12.40
2nd speed rpm : 1000
Rack travel in m: 12.00...12.20 rpm : 100 Speed Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0) 3rd speed rpm : 650 LOW IDLE Rack travel in m: 11.70...11.90 Speed rpm : 325 Aneroid/Altitude Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 47.0...53.0 1000 s: (44.0...56.0) Compensator Test cm3 : 8.00Spread 1st version 1000 s: (12.00) Setting Speed rom : 900 Remarks: Pressure hPa : 1200 : MAN-NR. 3-7201 Rack travel mm : 12.30...12.40 Setting and blocking of pointer of

start-of-delivery sensor on cyl. 5

Measurement

start of delivery

Note remarks

Test sheet

: MAN

Edition

: 31.07.92

Replaces

: 03.92

Test oil

: ISO-4113

Combination no.

: 0 402 735 807

Injection pump

Pump designation : PES5P120A720/3LS7250

EP type number

: 0 412 725 809

Governor

Governor design. : RQV325...1000PA960-9

Governer no.

: 0 421 815 309

Customer

Customer-spec. information : MAN

Engine

: D2865LF06/LU06

1st version kW

: 235.0

Rated speed

: 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening.

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.80...4.90

: (4.75...4.95)

Rack travel in mm : 15.00...16.00

Firing order

: 1-3-5-4-2

Phasing

: 0-72-144-216-288

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 5

BASIC SETTING

1st speed

rpm: 900

Rack travel in mm : 12.20...12.30

Del.guantity cm3/: 26.0...26.2

100 s: (25.7...26.5)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 325.0

2nd speed Rack travel in mm: 4.8...5.2

Del.quantity cm3/: 4.7...5.3

100 s: (4.4...5.6) Spread

cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1050

: 10.40...10.60 travel mm

rpm : 300 2nd speed

: 2.00...2.20 travel mm

3rd speed

rpm : 450

travel mm 3.50...4.10

4th speed

rpm : 750

travel mm

: 6.80...7.20

5th speed

rpm : 1350

: 13.00...14.00

travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1115

Rack travel in mm : 9.10...13.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 900

K26

Aneroid pressure h: 1200 Del.quantity : 260.0...265.0) Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 293...301 Testing: 1st rack travel in: 11.10 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1125...1155 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 248...256 Testing: rpm Speed : 225 Minimum rack trave: 6.50 Speed rom : 325 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION Speed rpm : 270...340 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 12.20...12.30 rpm : 1000 2nd speed Rack travel in m: 12.00...12.20 3rd speed rom : 650 Rack travel in m: 11.80...12.00 rpm : 400 4th speed Rack travel in m: 11.10...11.40 Aneroid/Altitude Compensator Test 1st version Setting : 900 Speed man Pressure hPa : 1200

: 12.20...12.30 Rack travel mm Measurement 1/min: 900 Speed 1st pressure hPa : -Rack travel in m: 8.10...8.30 K27

2nd pressure hPa : 170 Rack travel in m: 8.50...8.60 3rd pressure hPa : 600 Rack travel in m: 11.00...11.30 START CUT-OUT Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 1000 Speed Del.quantity cm3/: 245.0...251.0 1000 s: (242.0...254.0) Aneroid pressure h: 1200 Speed rpm : 650
Del.quantity cm3/: 272.0...278.0
1000 s: (269.0...281.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 159.0...161.0 1000 s: (156.0...164.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.10 rpm : 1040...1050 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0) LOW IDLE

rpm : 325 Speed Rack travel in mm : 4.80...5.20

Del.quantity cm3/: 47.0...53.0 1000 s: (44.0...56.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

: MAN-NR. 3-7203

Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

Note remarks

Test sheet : CUM 5,9 w
Edition : 21.05.92
Replaces : 11.91
Test oil : ISO-4113

Combination no. : 0 402 736 806

Injection pump

Pump designation : PES6P110A120RS7213 EP type number : 0 412 716 804

Governor

Governor design. : RQV400...1250PA964K

Governer no. : 0 421 815 252

Customer-spec. information Customer : C.D.C.

Engine : 6BTA-A

1st version kW : 171.5 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45

: (4.30...4.50) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to syl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 15.80...15.90

Del.quantity cm3/: 16.8...17.0

100 s: (16.5...17.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm: 400.0

Rack travel in mm : 5.7...5.9 Del quantity rm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.60...1.80

2nd speed rpm : 600

travel mm : 2.80...3.30

3rd speed rpm : 1300

travel mm : 7.20...7.40

4th speed rpm : 1500

travel mm : 8.90...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250 Aneroid pressure h: 1500

Del.quantity : 168.5...170.5

1000 : (165.5...173.5)

Spread cm3 : 5.00

1000 : (9.00)

#### RATED SPEED

1st version Control lever

position degrees: 59...67

Testing:

1st rack travel in: 14.80

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

Speed rpm : 1475...1505

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 13...21

Testina:

rpm Speed : 275 Minimum rack trave: 7.20 rpm : 400 Speed

Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 15.80...15.90

2nd speed rpm : 825

Rack travel in m: 14.70...14.90

rpm : 700 3rd speed

Rack travel in m: 14.00...14.40

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 1250 hPa : 1500 Speed man Pressure

: 15.80...15.90 Rack travel mm

Measurement

Speed 1/min: 1250

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 375

Rack travel in m: 10.00...10.10

3rd pressure hPa : 935

Rack travel in m: 13.70...14.10

START CUT-OUT

1/min: 300 (310) Speed

L01

### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 825

Del.quantity cm3/: 178.0...184.0 1000 s: (175.0...187.0)

cm3 : 8.00

Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 87.0...91.0

1000 s: (85.0...93.0)

## **BREAKAWAY**

1st version

1mm rack travel less than

full load rack tr: 14.80

rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 12.40...13.40

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0) cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3921769 : C.D.C. # 3913440

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

Note remarks

Test sheet : CUM 8,3 r : 21.05.92 Edition : 12.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump

Pump designation : PES6P11UA12ORS7214 EP type number : 0 412 716 805

Governor

: RQV350...1100PA964-1 Governor design.

: 0 421 815 253 Governer no.

Customer-spec. information Customer : C.D.C.

: SCTA-A Engine

: 201.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm : (4.30...4.50)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.70...15.80

Del.guantity cm3/: 20.6...20.8

100 s: (20.3...21.1)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 5.7...5.9 Del.guantity cm3/: 2.7...3.3

100 s: (2.5...3.5)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.80...2.00 travel mm

rpm : 450 2nd speed

: 3.10...3.50 travel mm

3rd speed rpm : 600

travel mm : 5.10...5.50

: 1000 4th speed rpm

: 8.10...8.30 travel mm

: 1200 5th speed rpm

: 9.60...10.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1500

Del.quantity : 200.0...201.0)

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 64...72 Testing: 1st rack travel in: 14.40 rpm : 1145...1155 Speed 2nd rack travel in: 4.00 rpm : 1300...1330 Speed 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 11...19 Testing: Speed rpm : 275 Minimum rack trave: 7.20 rpm : 350 Rack travel in mm : 5.70...5.90 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? rpm : 1050 1st speed Rack travel in m: 15.70...15.80 2nd speed rpm : 650 Rack travel in m: 13.20...13.60 rpm : 1100 3rd speed Rack travel in m: 15.40...15.60

Torque control curve - 1st version

Aneroid/Altitude Compensator Test

1st version Setting rpm : 1050Speed hPa : 1500 Pressure

Measurement

Rack travel mm : 15.70...15.80

Speed  $1/\min : 1050$ 

1st pressure hPa : -Rack travel in m: 8.10...8.50 2nd pressure hPa : 335 Rack travel in m: 10.10...10.20 3rd pressure hPa : 845

Rack travel in m: 13.60...14.00

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1500

Speed rpm : 650 Del.quantity cm3/ : 187.5...193.5 1000 s: (184.5...196.5)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 91.0...95.0 1000 s: (89.0...97.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.40 rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 11.00...12.00

LOW IDLE

rpm : 350 Speed Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0)

cm3 : 8.00

Spread 1000 s: (12.00)

Remarks:

: C.D.C. # 3921771 : C.D.C. # 3916627

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Bow dimension: Sliding-sleeve position = 37.0 mm

Note remarks

Test sheet : CUM 5,9 w 1 Edition : 21.05.92 : 11.91 Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 810

Injection pump

Pump designation : PES6P110A120RS7213

: 0 412 716 804 EP type number

Governor

Governor design. : RQV400...1250PA964-2

: 0 421 815 254 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6BTA-A

: 141.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 14.80...14.90

Del.quantity cm3/: 15.9...16.1

100 s: (15.6...16.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0Rack travel in mm: 5.4...5.6 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 400 1st speed

: 1.60...1.80 travel mm

rpm : 6002nd speed

: 2.80...3.30 travel mm

rpm : 13003rd speed

: 7.20...7.40 travel mm

rpm : 1500 4th speed

travel mm : 8.90...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1200

Del.quantity : 159.0...161.0 1000 : (156.0...164.0)

: 5.00

cm3 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 59...67

Testina:

1st rack travel in: 13.80

rpm : 1295...1305 Speed

2nd rack travel in: 4.00

Speed rpm : 1460...1490 4th rack travel in: 1600

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed rpm : 275 Minimum rack trave: 7.20

rpm : 400

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.80...14.90 2nd speed rpm : 800 Rack travel in m: 13.10...13.30

Aneroid/Altitude

Compensator Test

1st version

Setting

: 1250 Speed rpm hPa : 1200 Pressure

: 14.80...14.90 Rack travel mm

Measurement

Speed 1/min: 1250

1st pressure hPa : -

Rack travel in m: 8.30...8.70

2nd pressure hPa : 365

Rack travel in m: 10.20...10.30

3rd pressure hPa : 690

Rack travel in m: 13.20...13.60

START CUT-OUT

1/min : 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rom : 800

Del.quantity cm3/: 158.0...164.0 1000 s: (155.0...167.0)

cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

1000 s: (93.5...101.5)

**BREAKAWAY** 

Spread

1st version

1mm rack travel less than

full load rack tr: 13.80

rpm : 1295...1305 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 12.00...13.00

LOW IDLE

rpm : 400Speed

Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3921777

: C.D.C. # 3919090

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

L05

Note remarks

: CUM 5,9 w 2 : 21.05.92 Test sheet Edition : 03.92 Replaces Test oil : ISO-4113

: 0 402 736 811 Combination no.

Injection pump

Pump designation : PES6P110A120RS7213 : 0 412 716 804 EP type number

Governor

: RQV400...1250PA964-3 Governor design.

: 0 421 815 255 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6BTA-A

: 147.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45 : (4.30...4.50)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mr : 14.80...14.90

Del.quantity cm3/: 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 400.0

Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 3.2...3.8

100 s: (3.0...4.0)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.60...1.80

: 600 2nd speed rpm

travel mm : 2.80...3.30

: 1300 3rd speed rpm

: 7.20...7.40 travel mm

: 1500 4th speed rpm

: 8.90...9.30 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250 Aneroid pressure h: 1200

: 158.5...160.5 Del.quantity 1000 : (155.5...163.5)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 56...64

Testina:

1st rack travel in: 13.80

rpm : 1290...1300 Speed

2nd rack travel in: 4.00

Speed rpm : 1460...1490 4th rack travel in: 1600

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 12...20

Testina:

Speed rpm : 275 Minimum rack trave: 7.20

rpm : 400

Rack travel in mm : 5.50...5.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.80...14.90 2nd speed rpm : 800 Rack travel in m: 13.20...13.40

Aneroid/Altitude

Compensator Test

1st version

Setting

rpm : 1250 hPa : 1200 mm : 14.80...14.90 Speed rpm Pressure

Rack travel mm

Measurement

1/min: 1250 Speed

1st pressure hPa : -

Rack travel in m: 8.20...8.60

2nd pressure hPa : 365

Rack travel in m: 10.60...10.70

3rd pressure hPa : 690

Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min : 290 (300) FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 800

Del.quantity cm3/: 156.5...162.5 1000 s: (153.5...165.5)

cm3 : 8.00

Spread 1000 s: (12.0)

Aneroid pressure h: -

Speed rpm: 500 Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.80

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.guantity cm3/: 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 11.90...12.90

LOW IDLE

rpm : 400 Speed

Rack travel in mm : 5.50...5.70

Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3921776 : C.D.C. # 3918321

Start-of-delivery mark 6° cam angle after start of delivery cyl. 1

Note remarks

Test sheet : CUM 8,3 r 6 : 21.05.92 Edition : 02.92 Replaces : ISO-4113 Test oil

Combination no. : 0 402 736 812

Injection pump

Pump designation : PES6P110A120RS7214 EP type number : 0 412 716 805

Governor

Governor design. : RQV350...1200PA964-4

: 0 421 815 256 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 156.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 308

Outside diameter

x Wall thickness

: 6.00%2.00%600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm : (4.30...4.50)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 14.7...14.9

100 s: (14.4...15.2)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 350.0 2nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350 travel mm : 1.80...2.00

rpm : 450 2nd speed

: 3.10...3.50 travel mm

: 700 3rd speed rpm

5.90...6.30 travel mm

: 1200 4th speed rpm

: 9.00...9.20 travel mm

5th speed : 1400 rpm

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200 Aneroid pressure h: 1200

Del.quantity : 147.5...149.5 1000 : (144.5...152.5)

: 5.00 cm3 Spread 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 60...68 Testing: 1st rack travel in: 11.30 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 rpm : 1375...1405 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 11...19 Testing: Speed rpm : 275 Minimum rack trave: 7.20 rpm : 350 Speed Rack travel in mm : 5.40...5.60 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 12.30...12.40 rpm : ა50 2nd speed Rack travel in m: 10.90...11.30 3rd speed rpm : 550 Rack travel in m: 10.80...11.20 Aneroid/Altitude Compensator Test 1st version Settina : 1200 Speed rpm hPa : 1200 Pressure Rack travel mm : 12.30...12.40 Measurement 1/min : 1200 Speed 1st pressure hPa : -Rack travel in m: 7.50...7.90 2nd pressure hPa : 225 Rack travel in m: 8.90...9.00

START CUT-OUT Speed 1/min: 290 (300) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 650 Del.quantity cm3/ : 151.0...157.0 1000 s: (148.0...160.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 86.5...90.5 1000 s: (84.5...92.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 rpm : 1245...1255 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.70...11.70 LOW IDLE rpm : 350 Speed Rack travel in mm: 5.40...5.60

Del.quantity cm3/: 27.0...33.0

1000 s: (25.0...35.0)

Spread cm3: 8.00 1000 s: (12.00) Remarks: : C.D.C. # 3921774 : C.D.C. # 3917088 Start-of-delivery mark = 5.5° after start of delivery cyl. 1. Bow dimension: Sliding-sleeve position = 37.0 mm

3rd pressure hPa : 575

Rack travel in m: 11.20...11.60

Note remarks

Test sheet : CUM 8,3 r 4 : 21.05.92 Edition Replaces : 12.91 Test oil : ISO-4113

Combination no. : 0 402 736 813

Injection pump

Pump designation : PES6P110A120RS7214 EP type number : 0 412 716 805

Governor

Governor design. : RQV350...1100PA964-5

Governer no. : 0 421 815 257

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

: 187.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50) Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 18.6...18.8

100 s: (18.3...19.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 350 : 1.80...2.00 travel mm

rpm : 450 2nd speed

: 3.10...3.50 travel mm

3rd speed : 600 rpm

: 5.10...5.50 travel mm

4th speed : 1000 rpm

travel mm : 8.10...8.30

5th speed : 1200 rpm

: 9.60...10.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1500

Del.quantity : 180.3....01.5)

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 62...70

Testina:

1st rack travel in: 13.50 Speed rpm : 1145...1155

2nd rack travel in: 4.00

Speed rpm : 1290...1320

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed rpm : 275

Minimum rack trave: 7.20

rpm : 350

Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 14.50...14.60

2nd speed

nd speed rpm : 650 Rack travel in m: 13.50...13.70

3rd speed rpm : 500

Rack travel in m: 12.90...13.30

Aneroid/Altitude Compensator Test

1st version

Setting

: 1100 Speed rom

Pressure hPa : 1500 Rack travel mm : 14.50...14.60

Measurement

Speed 1/min: 1100

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 335

Rack travel in m: 10.10...10.20 3rd pressure hPa : 845

Rack travel in m: 13.60...14.00

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 650
Del.quantity cm3/: 198.0...204.0
1000 s: (195.0...207.0)

Spread

cm3 : 8.00 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 91.0...95.0 1000 s: (89.0...97.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

rpm : 1145...1155 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 10.80...11.80

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.70...5.90 Del.quantity cm3/: 27.0...33.0

1000 s: (25.0...35.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3921772

: C.D.C. # 3916628

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

Note remarks

: CUM 8,3 r 1 Test sheet Edition : 21.05.92 Replaces : 02.92

Test oil : ISO-4113

Combination no. : 0 402 736 814

Injection pump

Pump designation : PES6P110A120RS7214

EP type number : 0 412 716 805

Governor

Governor design. : RQV350...1200PA964-6

: 0 421 815 258 Governer no.

Customer-spec. information : C.D.C. Customer

Engine : 6CTA-A

1st version kW : 187.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 18.3...18.5

100 s: (18.0...18.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

Spread

GUIDE SLEEVE TRAVEL 1st speed

rpm : 350 : 1.80...2.00 travel mm

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm

: 1200

travel nm : 9.00...9.20

5th speed : 1400 rom

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1200

Del.quantity : 183.0...(03.0) 1000 : (180.0...188.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 62...70

Testing:

1st rack travel in: 13.50

rpm : 1245...1255 Speed

2nd rack travel in: 4.00

rpm : 1405...1435 Speed

4th rack travel in: 1500

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

Speed rpm : 275 Minimum rack trave: 7.20 : 350 rpm

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 14.50...14.60

2nd speed rpm : 650

Rack travel in m: 11.40...11.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 1200 rom Pressure hPa : 1200

: 14.50...14.60 Rack travel mm

Measurement

Speed 1/min : 1200

1st pressure hPa : -

Rack travel in m: 7.50...7.90

2nd pressure hPa : 320 Rack travel in m: 9.60...9.70

3rd pressure hPa : 860

Rack travel in m: 13.10...13.50

START CUT-OUT

1/min: 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 650 Del.quantity cm3/ : 165.5...171.5 1000 s: (162.5...174.5)

cm3 : 8.00Spread

1000 s: (12.0) Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 86.5...90.5

1000 s: (84.5...92.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 10.70...11.70

LOW IDLE

rpm : 350

Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3921775

: C.D.C. # 3917089

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm

Note remarks

Test sheet : CUM 8,3 r 5 : 21.05.92 Edition : 12.91 Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 815

Injection pump

Pump designation : PES6P110A120RS7214

EP type number : 0 412 716 805

Governor

Governor design. : RQV350...1000PA964-7

: 0 421 815 259 Governer no.

Customer-spec. information Customer : C.D.C.

: 6CTA-A Engine

1st version kW : 194.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

assembly : 1 688 901 101

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm : (4.30...4.50)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 15.80...15.90

Del.quantity cm3/: 21.7...21.9

100 s: (21.4...22.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.60...1.80 travel mm

rpm : 450 2nd speed

: 3.00...3.40 travel mm : 600

3rd speed rpm

: 5.20...5.60 travel mm

: 1000 4th speed rpm

: 8.40...8.60 travel mm

rpm : 1150 5th speed

: 9.80...10.20 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1500

Del.quantity : 217.0...222.0)

cm3 : 5.00 Spread 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 62...70 Testina: 1st rack travel in: 14.30 Speed rpm : 1050...1060 2nd rack travel in: 4.00 Speed rpm : 1205...1235 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 11...19 Rack travel in mm: 5.7 Testina: Speed : 275 rpm Minimum rack trave: 7.20 rpm : 350 Speed Rack travel in mm : 5.60...5.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 900 Rack travel in m: 15.80...15.90 2nd speed rpm : 650 Rack travel in m: 14.00...14.40 3rd speed rpm : 1000 Rack travel in m: 15.30...15.50 Aneroid/Altitude Compensator Test 1st version Settina : 900 Speed rom hPa : 1500 Pressure Rack travel mm : 15.80...15.90 Measurement 1/min: 900 Speed 1st pressure hPa : -Rack travel in m: 8.10...8.50 2nd pressure hPa : 335 Rack travel in m: 10.10...10.20

START CUT-OUT 1/min: 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500 rpm : 650 Speed Del.quantity cm3/: 211.0...217.0 1000 s: (208.0...220.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 91.0...95.0 1000 s: (89.0...97.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 14.30 rpm : 1050...1060 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.90...11.90 LOW IDLE Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks:

: C.D.C. # 3921773 : C.D.C. # 3916629

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Bow dimension: Sliding-sleeve position = 37.0 mm

3rd pressure hPa : 845

Rack travel in m: 13.60...14.00

Note remarks

: CUM 8,3 r 2 : 21.05.92 Test sheet Edition : 11.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 736 816

Injection pump

Pump designation : PES6P110A120RS7214 : 0 412 716 805 EP type number

Governor

Governor design. : RQV350...1200PA964-8

: C 421 815 264 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

: 213.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Openina (

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45 : (4.30...4.50)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 14.70...14.80

Del.guantity cm3/: 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

cm3 : 0.8Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.80...2.00 travel mm

2nd speed rpm : 450

travel mm : 3.10...3.50

: 700 3rd speed rpm

: 5.90...6.30 travel mm

: 1200 4th speed r pm

: 9.00...9.20 travel mm

rpm : 14005th speed

travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

cm3 : 5.00Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 62...70 Testing: 1st rack travel in: 13.20 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 rpm : 1400...1430 Speed 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 11...19 Testina: Speed rpm : 275 Minimum rack trave: 7.20 rpm : 350 Rack travel in mm : 5.60...5.80 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 14.70...14.80 rpm : 650 2nd speed Rack travel in m: 12.60...13.00 3rd speed rpm : 1200 Rack travel in m: 14.20...14.40 Aneroid/Altitude Compensator Test 1st version Settina rpm : 1100 hPa : 1200 Speed rom Pressure Rack travel mm : 14.70...14.80

Measurement 1/min: 1100 Speed 1st pressure hPa : -Rack travel in m: 7.80...8.20 2nd pressure hPa : 335 Rack travel in m: 9.60...9.70 3rd pressure hPa : 785 Rack travel in m: 12.80...13.20 117

START CUT-OUT 1/min : 290 (300) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 650
Del.quantity cm3/ : 181.0...187.0
1000 s: (178.0...190.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 90.0...94.0 1000 s: (88.0...96.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.20 Speed rpm : 1245...1255 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.70...11.70 LOW IDLE rpm : 350 Speed Rack travel in mm : 5.60...5.80 Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: : C.D.C. # 3921770 : C.D.C. # 3916626 Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

Bow dimension: Sliding-sleeve position = 37.0 mm

Note remarks

Test sheet

: MAN

Edition

: 31.07.92

Replaces

: 02.92

Test oil

: ISO-4113

Combination no. : 0 402 736 824

Injection pump

Pump designation : PES6P120A720/3LS7251

EP type number

: 0 412 726 860

Governor

Governor design.

: RQV300...1000PA962-7

Governer no.

: 0 421 815 302

Customer

Customer-spec. information : MAN

Engine

: D2866LF06

1st version kW

: 309.0

Rated speed

: 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Openina |

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0.8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90

: (4.75...4.95)

Rack travel in mm : 15.00...16.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60

& maximum rack tra: 15.0...16.0

Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed

rpm: 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 28.5...28.7

100 s: (28.2...29.0)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.0...5.4

Del.quantity cm3/: 2.9...3.5

100 s: (2.6...3.8)

Spread

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1050

: 9.10...9.30 travel mm

2nd speed

rpm : 300

travel mm

: 3.70...3.90

3rd speed travel mm rpm : 450

: 4.20...4.60

4th speed

rpm : 770

: 5.80...6.20

travel mm 5th speed

rpm : 1350

travel mm

: 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed

rpm : 1140

L18

Rack travel in mm : 10.10...14.10 Measurement FULL LOAD DELIV. AT FULL LOAD STOP  $1/\min : 900$ Speed 1st version 1st pressure hPa : rpm : 900 Rack travel in m: 8.90...9.10 Speed Aneroid pressure h: 1200 2nd pressure hPa : 220 Rack travel in m: 9.40...9.50 : 285.0...287.0 Del.quantity 3rd pressure hPa : 720 Rack travel in m: 11.80...12.20 1000 : (282.0...290.0) cm3 : 5.00 1000 : (9.00) Spread START CUT-OUT RATED SPEED 1/min: 240 (260) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 288...296 Testing: 1st version 1st rack travel in: 12.10 Aneroid pressure h: 1200 rpm : 1040...1050 rpm : 1000 Speed Speed 2nd rack travel in: 4.00 Del.quantity cm3/: 257.0...263.0 rpm : 1125...1155 Speed 1000 s: (254.0...266.0) Aneroid pressure h: 1200 4th rack travel in: 1250 rpm : 0.00...1.00: 750 Speed Speed rpm Del.quantity cm3/: 270.0...276.0 1000 s: (267.0...279.0) LOW IDLE 1 Control Lever Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 166.0...168.0 1000 s: (163.0...171.0) position degrees: 243...251 Testing: Speed rom : 200 Minimum rack trave: 6.70 rpm : 300 Speed **BREAKAWAY** Rack travel in mm : 5.10...5.30 1st version CONSTANT REGULATION 1mm rack travel less than rpm : 240...360 Speed full load rack tr: 12.10 rpm : 1040...1050 TORQUE CONTROL Speed Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY rpm : 900 1st speed Rack travel in m: 13.50...13.60 rpm : 1000 2nd speed Speed rpm : 100 Rack travel in m: 13.00...13.20 Del.quantity cm3/: 210.0...230.0 rpm : 750 1000 s: (206.0...234.0) 3rd speed Rack travel in m: 12.70...12.90 rpm : 400 4th speed LOW IDLE Rack travel in m: 11.50...11.70 Speed rpm: 300 Rack travel in mm: 5.00...5.40 Del.quantity cm3/: 29.0...35.0 1000 s: (26.0...38.0) Aneroid/Altitude Compensator Test Spread cm3 : 8.001000 s: (12.00) 1st version Setting Speed המח : 900 Remarks: hPa : 1200 Pressure : MAN-NR, 2-7204 Rack travel mm : 13.50...13.60

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN : 31.07.92 Edition : 02.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 736 825 Injection pump Pump designation : PES6P120A720/3LS7251 : 0 412 726 860 EP type number Governor Governor design. : RQV300...1000PA962-8 : 0 421 815 303 Governer no. Customer-spec. information Customer : MAN Engine : D2866LF09 1st version kW : 309.0 : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina | pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 089 Outside diameter x Wall thickness : 8.00X2.50X600 x Length mm

(A) Injection pump setting values

Set equal delivery quant.

per values \_\_\_\_

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

Insp. values in parentheses

: 4.80...4.90 Prestroke mm : (4.75...4.95) Rack travel in mm : 15.00...16.00 : 6-2-4-1-5-3 Firing order Phasing : 0-60-120-180-240-300 Tolerance  $+ - ^{\circ}$  : 0.50 (0.75) Time to cyl. no. : 6 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 13.90...14.00 Del.guantity cm3/: 29.9...30.1 100 s: (29.6...30.4) Spread cm3 : 0.5100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 5.0...5.4 Del.quantity cm3/: 2.9...3.5 100 s: (2.6...3.8) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1050 1st speed : 9.10...9.30 travel mm rpm : 3002nd speed : 3.60...4.00 travel mm 3rd speed rpm : 450 : 4.10...4.70 travel mm 4th speed rpm : 770 : 5.80...6.20 travel mm rpm : 1350 5th speed : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1130 Speed

Rack travel in mm : 10.40...14.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rom: 900 Aneroid pressure h: 1200 Del.quantity : 299.0...304.0) 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 287...295 Testing: 1st rack travel in: 12.40 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1125...1155 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 243...251 Testing: Speed rpm : 200 Minimum rack trave: 7.30 rpm : 300 Rack travel in mm : 5.10...5.30 CONSTANT REGULATION Speed rpm : 240...360 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 900 1st speed Rack travel in m: 13.90...14.00 2nd speed rpm : 1000 Rack travel in m: 13.40...13.60 rpm : 750 3rd speed Rack travel in m: 13.30...13.50 4th speed rpm : 400 Rack travel in m: 11.90...12.20 Aneroid/Altitude Compensator Test 1st version Setting : 900 Speed rom Pressure hPa : 1200

: 13.90...14.00

Measurement 1/min: 900 Speed 1st pressure hPa : -Rack travel in m: 9.00...9.20 2nd pressure hPa : 220 Rack travel in m: 9.40...9.50 3rd pressure hPa : 720 Rack travel in m: 11.80...12.20 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1000
Del.quantity cm3/: 271.0...277.0
1000 s: (268.0...280.0) Aneroid pressure h: 1200 Speed rpm : 750 Del.guantity cm3/: 288.0...294.0 1000 s: (285.0...297.0) Aneroid pressure h: -: 500 Speed man Del.quantity cm3/: 168.0...170.0 1000 s: (165.0...173.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.40 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 200.0 ..220.0 1000 s: (196.0...224.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 5.00...5.40 Del.quantity cm3/ : 29.0...35.0 1000 s: (26.0...38.0) Spread cm3 : 8.001000 s: (12.00) Remarks: : MAN-NR. 3-7206

Rack travel mm

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.80...4.90 Prestroke mm : (4.75...4.95) Rack travel in mm : 15.00...16.00 Note remarks Test sheet : MAN : 6-2-4-1-5-3 Firing order Edition : 31.07.92 : 02.92 Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasing Combination no. : 0 402 736 826 Tolerance + - ° : 0.50 (0.75) Injection pump Pump designation: PES6P120A720/3LS7251 Time to cyl. no. EP type number : 0 412 726 860 Governor BASIC SETTING Governor design. : RQV300...1000PA962-9 rpm: 750 1st speed : 0 421 815 304 Governer no. Rack travel in mm : 12.70...12.80 Customer-spec. information Del.quantity cm3/: 29.1...29.3 Customer Engine : D2866LU04 100 s: (28.8...29.6) : 309.0 cm3 : 0.51st version kW Spread Rated speed : 2000 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0Rack travel in mm : 4.4...4.8 Del.quantity cm3/ : 2.9...3.5 Test oil inlet temp. °C : 38...42 100 s: (2.6...3.8) Overflow valve Spread cm3 : 0.8: 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 105 assembly GUIDE SLEEVE TRAVEL rpm : 1050 1st speed : 9.10...9.30 Openina | travel mm rpm : 300 pressure, bar : 207...210 2nd speed travel mm : 3.70...3.90 Orifice plate rpm : 450 3rd speed diameter mm : 4.20...4.60 : 0,8 travel mm 4th speed rpm : 770 travel mm : 5.80...6.20 rpm : 1350Test lines : 1 680 750 089 5th speed : 13.00...14.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 8.00x2.50x600 Control-lever position Degree: -1 rpm : 1140 (A) Injection pump setting values Speed Insp. values in parentheses Rack travel in mm : 10.00...14.00 Set equal delivery quant. per values \_\_\_ FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 750

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Aneroid pressure h: 1200 : 291.0...293.0 Del.quantity

1000 : (288.0...296.0)

Spread

: 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 287...295

Testina:

1st rack travel in: 12.00

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1125...1155

4th rack travel in: 1250

LOW IDLE 1 Control lever

position degrees: 243...251

Testing:

: 200 Speed rpm Minimum rack trave: 6.10 rpm : 300

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

rpm : 240...360 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 750

Rack travel in m: 12.70...12.80

rpm : 900 2nd speed

Rack travel in m: 13.00...13.20

3rd speed rpm : 1000

Rack travel in m: 12.90...13.10

Aneroid/Altitude Compensator Test

1st version

Settina

Speed rom : 900 Pressure hPa : 1200

Rack travel mm : 13.00...13.20

Measurement

1/min: 900 Speed

1st pressure hPa : -

Rack travel in m: 8.30...8.50

2nd pressure hPa : 200

Rack travel in m: 8.70...8.80

3rd pressure hPa : 660

Rack travel in m: 11.30...11.50

START CUT-OUT

1/min : 240 (260) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 1000

Del.quantity cm3/: 275.0...282.0

1000 s: (272.0...285.0)

Aneroid pressure h: 1200 rpm : 900

Del.quantity cm3/: 291.0...297.0

1000 s: (288.0...300.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 169.0...171.0 1000 s: (166.0...174.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

rpm : 1040...1050 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 200.0...220.0

1000 s: (196.0...224.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.40...4.80 Del.quantity cm3/: 29.0...35.0 1000 s: (26.0...38.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 3-7208

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6

start of delivery

Note remarks

Test sheet : MAN 11,9 z
Edition : 31.07.92
Replaces : 01.92

Combination no. : 0 402 736 827

Injection pump

Pump designation : PES6P120A720/3LS7251

: ISO-4113

EP type number : 0 412 726 860

Governor

Test oil

Governor design. : RQV300...1000PA960-6

K

Governer no. : 0 421 815 306

Customer—spec. information Customer : MAN

Engine : D2866LF06

1st version kW : 309.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 15.00...16.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 28.5...28.7

100 s: (28.2...29.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 2.9...3.5 100 s: (2.6...3.8)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1055

travel mm : 10.40...10.60

2nd speed rpm : 300

travel mm : 1.90...2.30

3rd speed rpm : 500

travel mm : 3.50...4.10
4th speed rpm : 750

travel mm : 6.80...7.20

5th speed rpm : 1350

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1120

Pack travel in mm : 10.20...14.20 Measurement FULL LOAD DELIV. AT FULL LOAD STOP Speed 1/min: 900 1st version 1st pressure hPa : rpm : 900 Rack travel in m: 8.90...9.10 Speed Aneroid pressure h: 1200 2nd pressure hPa : 220 Del.quantity : 283.0...290.0) Rack travel in m: 9.50...9.60 3rd pressure hPa : 720 Rack travel in m: 11.90...12.20 : 5.00 cm3 Spread 1000 : (9.00) START CUT-OUT RATED SPEED 1/min: 240 (260) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 296...304 Testina: 1st version 1st rack travel in: 12.20 Aneroid pressure h: 1200 Speed rpm : 1000 Del.quantity cm3/ : 261.0...267.0 1000 s: (258.0...270.0) rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1125...1155 Speed 4th rack travel in: 1250 Aneroid pressure h: 1200 Speed rpm : 0.00...1.00Speed rpm : 750 Del.quantity cm3/: 271.0...277.0 LOW IDLE 1 1000 s: (268.0...280.0) Control Lever Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 166.0...168.0 1000 s: (163.0...171.0) position degrees: 249...257 Testina: Speed : 100 rom Minimum rack trave: 6.70 rpm : 300 **BREAKAWAY** Rack travel in mm : 5.10...5.30 1st version CONSTANT REGULATION 1mm rack travel less than rpm : 320...440 Speed full load rack tr: 12.20 TORQUE CONTROL Speed rpm : 1040...1050 Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY 1st speed rpm : 900 Rack travel in m: 13.50...13.60 rpm : 1000 2nd speed Speed rpm : 100 Rack travel in m: 13.10...13.30 Del.quantity cm3/: 210.0...230.0 3rd speed rpm : 750 1000 s: (206.0...234.0) Rack travel in m: 12.70...12.90 4th speed rom : 400 LOW IDLE Rack travel in m: 11.50...11.70 Speed rpm: 300 Rack travel in mm: 5.30...5.40 Del.quantity cm3/: 29.0...35.0 1000 s: (26.0...38.0) Aneroid/Altitude Compensator Test cm3 : 8.00 Spread 1st version 1000 s: (12.00) Setting Speed : 900 Remarks: rom hPa : 1200 Pressure : MAN-NR 3-7205

: 13.50...13.60

Rack travel mm

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 11,9 21 : 31.07.92 Edition Replaces : 01.92 Test oil : ISO-4113 : 0 402 736 828 Combination no. Injection pump Pump designation : PES6P120A720/3LS7251 EP type number : 0 412 726 860 Governor Governor design. : RQV300...1000PA960-7 : 0 421 815 307 Governer no. Customer-spec. information : MAN Customer : 02866LF09 Engine : 309.0 1st version kW Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

> Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.80...4.90 Prestroke mm : (4.75...4.95)

Rack travel in mm : 15.00...16.00 : 6-2-4-1-5-3 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm : 9001st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 29.9...30.1

100 s: (29.6...30.4)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 2.9...3.5

100 s: (2.6...3.8) cm3 : 0.8

Spread 190 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1055 1st speed

: 10.40...10.60 travel mm

2nd speed

rpm : 300 : 2.00...2.40 travel mm

rpm : 450 3rd speed

: 3 40...4.00 travel mm

rpm : 750 4th speed

: 6.80...7.20 travel mm

5th speed rpm : 1350

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree:

rpm : 1,20

Rack travel ir mm : 10.50...14.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200 : 299.0...301.0 Del.quantity 1000 : (296.0...304.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 296...304 Testing: 1st rack travel in: 12.50 Speed rpm: 1040...1050 2nd rack travel in: 4.00 rpm : 1135...1165 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 247...255 Testing: Speed rom : 200 Minimum rack trave: 6.70 : 300 Speed rpm Rack travel in mm : 5.10...5.30 CONSTANT REGULATION Speed rpm : 300...420 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 900 1st speed Rack travel in m: 13.90...14.00 rpm : 1600 2nd speed Rack travel in m: 13.40...13.60 rpm : 750 3rd speed Rack travel in m: 13.30...13.50 4th speed rpm : 400 Rack travel in m: 11.90...12.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 900 man hPa : 1200 Pressure Rack travel mm : 13.90...14.00 Measurement 1/min: 900 Speed 1st pressure hPa : -Rack travel in m: 9.00...9.20

2nd pressure hPa : 220 Rack travel in m: 9.40...9.50 3rd pressure hPa : 720 Rack travel in m: 11.80...12.10 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1000 Del.quantity cm3/: 272.0...278.0 1000 s: (269.0...281.0) Aneroid pressure h: 1200 Speed rom : 750 Del.quantity cm3/: 289.0...295.0 1000 s: (286.0...298.0) Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 168.0...170.0
1000 s: (165.0...173.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Del.quantity cm3/: 190.0...220.0 1000 s: (186.0...224.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 5.00...5.40 Del.quantity cm3/: 29.0...35.0 1000 s: (26.0...38.0) Spread cm3 : 8.00 1000 s: (12.00) Remarks: : MAN-NR. 3-7207 Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 start of delivery

Note remarks

Test sheet : MB

Edition : 26.06.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 332

Injection pump

Pump designation : PES6P120A720/3LS7161

: 0 412 726 877 EP type number

Governor

Governor design. : RQV300...1050PA940-3

Governer no. : 0 421 813 827

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M447 A

1st version kW : 213.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzie holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 9.00...12.00 Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 20.1...20.3

100 s: (19.8...20.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 6.2...6.8

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.6100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.50...1.00

: 575 2nd speed rpm

travel mm : 4.30...4.80

: 830 3rd speed rom

travel mm : 5.90...6.40

4th speed : 1108 rpm

travel mm : 8.10...8.60

5th speed : 1190 rpm

: 9.70...10.20 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 Speed rpm : 1085

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

MO2

1st version Speed rom : 600Aneroid pressure h: 681 Del.quantity : 201.0...203.0 1000 : (198.0...206.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED ist version Control lever position degrees: 117...125 Testina: 1st rack travel in: 12.50 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm: 1150...1180 4th rack travel in: 1250 Speed rom : 0.00...1.00LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed rpm : 200 Minimum rack trave: 8.60 rpm : 300 Speed Rack travel in mm : 6.40...6.60 CONSTANT REGULATION rpm : 300...450 Speed TORQUE CONTROL Dimension a mm : 1.20 : 1050 2nd speed תקח Rack travel in m: 13.50...13.70 3rd speed rpm : 750 Rack travel in m: 14.70...14.90 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 680 Pressure Rack travel mm : 14.10...14.30 Measurement Speed 1/min: 600 1st pressure hPa : 300 Rack travel in m: 12.40...12.60

3rd pressure hPa : 800 Rack travel in m: 14.20...14.30 \* 4th pressure hPa : -Rack travel in m: 11.30...11.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed : 1050 rpm Del.quantity cm3/: 193.0...195.0 1000 s: (190.0...198.0) : 8.00 Spread cm3 1000 s: (12.0) Aneroid pressure h: 1200 : 750 Speed rpm Del.quantity cm3/: 218.0...222.0 1000 s: (215.0...225.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 144.0...146.0 1000 s: (141.0...149.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 170.0...190.0 1000 s: (166.0...194.0) Remarks: \* Increase in control-rod travel with

respect to setting at least 0.1 mm

2nd pressure hPa : 400

Rack travel in m: 13.10...13.30

Note remarks

Test sheet

: MB

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 736 833

Injection pump

Pump designation : PES6P120A720LS7161

-11

EP type number

: 0 412 726 877

Governor

Governor design.

: RQ30C/1050PA897

Governer no.

: 0 421 801 452

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M447 A

1st version kW

: 213.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 019

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 067

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rom : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 20.1...20.3

100 s: (19.8...20.6)

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 6.0...6.4

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread

Spread

cm3 : 0.6100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 600

Aneroid pressure h. 680 Del.quantity

: 201.0...203.0 1000 : (198.0...206.0)

Spread

: 5.00 cm3

: (9.00) 1000

RATED SPEED

1st version

Setting point:

Speed

: 600 rom

MO4

Rack travel in mm: 20.0 Testina: 1st rack travel in: 12.50 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 rpm : 1160 ... 1190 Speed 4th rack travel in: 1250 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed : 300 rpm Rack travel in mm: 6.2 Testing: : 200 Speed rpm Minimum rack trave: 7.70 Speed : 300 rpm Rack travel in mm: 6.00...6.40 Rack travel in mm: 2.00 Speed : 380...420 rpm TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 13.50...13.70 : 750 2nd speed rpm Rack travel in m: 14.80...15.00 Ameroid/Altitude Compensator Test 1st version Setting Speed : 600 rom Pressure hPa : 680 : 14.10...14.30 Rack travel mm Measurement 1/min : 600Speed 1st pressure hPa : 300 Rack travel in m: 12.40...12.60 2nd pressure hPa : 400 Rack travel in m: 13.10...13.30 3rd pressure hPa : 800 Rack travel in m: 14.20...14.30 \* 4th pressure hPa : -Rack travel in m: 11.30...11.60 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 rpm : 1050 Speed Del.quantity cm3/: 193.0...195.0 1000 s: (190.0...198.0) Spread cm3 : 3.00 1000 s: (12.0) Aneroid pressure h: 1200 Speed : 750 rpm Del.quantity cm3/: 218.0...222.0 1000 s: (215.0...225.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 144.0...146.0 1000 s: (141.0...149.0) Spread cm3 : 8.001000 s: (12.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.50 rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

Speed : 100 rprii Del.quantity cm3/: 190.0...210.0 1000 s: (186.0...214.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : FIA 9,5 a 1 : 21.05.92 Edition : 12.90 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 857 Injection pump Pump designation : PES6P120A720RS7177 : 0 412 726 823 EP type number Governor Governor design. : RQ275/1100PA915 : C 421 801 478 Governer no. Customer-spec, information Customer : IVECO-UNIC Engine : 8460.21.601 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.00...5.10

Rack travel in mm : 9.00...12.00

: (4.95...5.15)

Firing order : 1-5- 3- 6- 2- 4 Phasing : 0-60-120-180-240-300 Tolerance + - ° ; 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 12.30...12.40 Del.quantity cm3/: 18.3...18.5 100 s: (18.0...18.8) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 275.0
Rack travel in mm : 5.7...5.9
Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) Spread cm3 : 0.8100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm: 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 900 Del.quantity : 183.0...185.0 1000 : (180.0...188.0) Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Setting point: Speed : 600 rpm Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.30 rpm : 1145...1160 Speed 2nd rack travel in: 4.00

rpm : 1230...1260

Speed

M06

Prestroke mm

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275 Rack travel in mm: 5.8

Testing:

rpm : 100 Speed Minimum rack trave: 7.30 Speed rpm : 275 Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.60...12.70

2nd speed rpm : 600

Rack travel in m: 12.60...12.80

Aneroid/Altitude

Compensator Test

1st version Setting

Speed rpm : 500 Pressure tiPa : 900

Rack travel mm : 12.30...12.40

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.90...10.10

2nd pressure hPa : 320

Rack travel in m: 11.70...11.80

3rd pressure hPa : 260

Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500 Del.quaritity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

:

Remarks:

APPLICATION

**Omnibus** 

M07

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : RVI 12,0 i Edition : 26.06.92 Replaces : 01.92 Test oil : ISO-4113 Combination no. : 0 402 746 878 Injection pump Pump designation : PES6P120A320RS7191 EP type number : D 412 726 828 Governor Governor design. : RQV275...1000PA927 Governer no. : 0 421 813 808 Customer-spec, information Customer : RVI Engine : MIDR 05-35-40 1st version kW : 314.0 Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Opening | pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 089 Outside diameter x Wall thickness x Lenath mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Prestroke mm : 4.80...4.90 : (4.75...4.95) Rack travel in mm : 12.50...13.50 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm: 600 1st speed Rack travel in mm : 14.00...14.10 Del.quantity cm3/: 28.7...28.9 100 s: (28.4...29.2) Spiread cm3 : 0.5100 s: (0.9) rpm : 275.0 2nd speed Rack travel in mm: 9.1...9.5 Del.quantity cm3/: 2.0...2.6 100 s: (1.7...2.9) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 275 travel mm : 1.10...1.50 rpm : 500 2nd speed travel mm 3.60...4.20 3rd speed 700 rpm : : 5.50...5.90 travel mm 1000 4th speed rpm : travel mm : 7.60...7.80 5th speed : 1400 rpm : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1060 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 900 Del.quantity : 207.3...292.5)

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 300...308

Testing:

1st rack travel in: 13.00 rpm : 1065...1075 Speed 2nd rack travel in: 10.00 rpm : 1195...1225 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 245...253

Testing:

Speed : 200 rpm Minimum rack trave: 5.90 rpm : 275

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 330...430 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed man hPa : 900 Pressure

Rack travel mm : 14.00...14.10

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.90

2nd pressure hPa : 520

Rack travel in m: 13.30...13.40

3rd pressure hPa : 200

Rack travel in m: 10.06...11.00

START CUT-OUT

1/min: 225 (245) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm : 1000

M09

Del.quantity cm3/: 264.0...270.0

1000 s: (261.0...273.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 168.0...170.0

1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed **rpm** : **1065**...1075

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 156.0...186.0

1000 s: (152.0...190.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.50...4.90 Del.quantity cm3/: 20.0...26.0 1000 s: (17.0...29.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Note remarks

Test sheet : RVI 6,2 i
Edition : 03.04.92
Replaces : 06.91
Test oil : ISO-4113

Combination no. : 0 402 746 894

Injection pump

Pump designation : PES6P110A320RS7208 EP type number : 0 412 716 803

Governor

Governor design. : RQV275...1175PA942

-1K

Governer no. : 0 421 815 244

Customer—spec. information Customer : RVI

Engine : MIDRO60226 M

1st version kW : 210.0 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.10...4.20

: (4.05...4.25)

Rack travel in mm : 13.00...14.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...14.10 & maximum rack tra: 20.0...21.0 Difference \* CS : 2.75...4.25

BASIC SETTING

1st speed rpm: 1175

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 17.0...17.2

100 s: (16.7...17.4)

Spread cm3:0.4

100 s: (0.7)

2nd speed rpm : 275.0 Rack travel in mm : 4.9...5.5

Del.quantity cm3/: 1.9...2.3 100 s: (1.6...2.5)

Spread cm3 : 0.4 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 9.10...9.20

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 550

travel mm : 3.80...4.20

4th speed rpm : 1000

travel mm : 7.00...7.40

5th speed rpm : 1600

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 1400

Rack travel in mm: 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

M10

1st version Speed rpm : 1175 Aneroid pressure h: 1000 Del.quantity : 170.0...172.0 1000 : (167.5...174.5) : 4.00 Spread cm3 1000 : (7.50) RATED SPEED 1st version Control Lever position degrees: 110...118 Testing: 1st rack travel in: 13.00 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 rpm : 1415...1445 Speed 4th rack travel in: 1600 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 56...64 Testing: Speed rpm : 200 Minimum rack trave: 5.80 : 275 Speed mom Rack travel in mm : 5.10...5.30 CONSTANT REGULATION rpm : 350...480 Speed TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 1175 Rack travel in m: 14.00...14.10 2nd speed rpm : 700 Rack travel in m: 13.25...13.45 3rd speed rpm : 800 Rack travel in m: 13.50...13.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1175 rpm hPa : 1000 Pressure Rack travel mm : 14.00...14.10 Measurement 1/min : 1175 Speed 1st pressure hPa : -

Rack travel in m: 10.40...11.00 2nd pressure hPa : 520 Rack travel in m: 12.50...12.60 3rd pressure hPa : 240 Rack travel in m: 11.10...11.50 START CUT-OUT Speed 1/min: 200 (220) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 700 Del.quantity cm3/: 148.0...154.0 1000 s: (145.0...157.0) Aneroid pressure h: Speed rpm : 500 Del.quantity cm3/ : 74.0...76.0 1000 s: (71.5...78.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rpm : 1240...1250 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 90.0...120.0 1000 s: (86.0...124.0) LOW IDLE Speed rpm : 275
Rack travel in mm : 4.90...5.50 Del.quantity cm3/: 19.0...23.0 1000 s: (16.5...25.5) Spread cm3 : 4.50 1000 s: (7.50) Remarks:

M11

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAC 12,0 h2 Edition | : 21.05.92 Replaces : 02.91 Test oil : ISO-4113 Combination no. : 0 402 746 896 Injection pump Pump designation : PES6P120A720RS7200 EP type number : 0 412 726 833 Governor Governor design. : RQV325...900PA944-11 : 0 421 815 260 Governer no. Customer-spec. information Customer : MACK TRUCKS Engine : E7-350 1st version kW : 261.0 Rated speed : 1800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 011 Overflow quantity min. 1/h: 160...170 Test nozzle holder assembly : 1 688 901 101 Openina . : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test Lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Test pressure, bar: 22...24 : 2.75...2.85 : (2.70...2.90) Prestroke mm Rack travel in mm : 11.00...13.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 900 Rack travel in mm : 14.50...14.60 Del.quantity cm3/: 27.7...27.9 100 s: (27.4...28.2) Spread cm3 : 0.5100 s: (0.9) rpm : 340.0 2nd speed Rack travel in mm : 4.6...4.8 Del.quantity cm3/ : 3.1...3.7 100 s: (2.9...3.9) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 325 travel mm : 1.40...1.60 2nd speed : 450 rpm travel mm : 2.80...3.20 3rd speed : 700 rpm travel mm : 6.00...6.40 4th speed : 900 rpm travel mm : 8.50...8.70 5th speed : 1050 rpm travel mm : 9.80...10.20 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 900 Aneroid pressure h: 1200 : 277.5...279.5 Del.quantity 1000 : (274.5...282.5) Spread cm3 : 5.00 1000 : (9.00)

per values

BEGINNING OF DELIVERY

RATED SPEED

1st version Control Lever

position degrees: 59...67

Testina:

1st rack travel in: 13.50 Speed rpm : 940...990 2nd rack travel in: 4.00

rpm : 1115...1125

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 8...16

Testing:

Speed : 275 rpm Minimum rack trave: 6.00 rpm : 340

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

: 900 1st speed rpm

Rack travel in m: 14.50...14.60

rpm : 625 2nd speed

Rack travel in m: 13.80...14.00

rpm : 675 3rd speed

Rack travel in m: 13.80...14.00

4th speed rpm : 500

Rack travel in m: 11.90...12.70

Ameroid/Altitude Compensator Test

1st version

Setting

: 900 Speed rpm Pressure hPa : 1200

Rack travel mm : 14.50...14.60

Measurement

Speed 1/min: 900

1st pressure hPa : -

Rack travel in m: 7.90...8.30

2nd pressure hPa : 400

Rack travel in m: 9.80...9.90
3rd pressure hPa : 775
Rack travel in m: 12.60...13.00

START CUT-OUT

1/min: 250 (255) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm\_ : 625

Del.quantity cm3/: 290.0...296.0 1000 s: (287.0...299.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/: 199.0...201.0 \* 1000 s: (180.5...207.0)

Aneroid pressure h: -

Speed rpm : 400 Del.quantity cm3/ : 150.0...154.0 1000 s: (148.0...156.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed : 940...990 man

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 170.0...210.0 1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 31.0...37.0 1000 s: (29.0...39.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only to the engine/nozzle-and-holder

assemblies on an injection-pump test

bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 22...24 Prestroke mm : 3.25...3.35 : (3.20...3.40) Rack travel in mm : 11.00...13.00 Note remarks : MAC 12,0 h1 : 21.05.92 Test sheet Edition Firing order : 1-5-3-6-2-4 Replaces : 02.91 Test oil : ISO-4113 Combination no. : 0 402 746 897 Phasina : 0-60-120-180-240-300 Phasing Injection bumb Tolerance + - ° : 0.50 (0.75) Pump designation : PES6P120A720RS7200 EP type number : 0 412 726 833 Time to cyl. no. : 1 Governor Governor design. : RQV325...875PA944-12 BASIC SETTING : 0 421 815 261 Governer no. 1st speed rpm: 875 Customer-spec. information Rack travel in mm : 14.20...14.30 Customer : MACK TRUCKS Del.quantity cm3/: 25.5...25.7 Engine : EM7-300 100 s: (25.2...26.0) 1st version kW : 224.0 Rated speed : 1750 Spread cm3 : 0.5TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil 2nd speed rpm : 340.0inlet temp. °C : 38...42 Rack travel in mm: 4.6...4.8 Del.quantity cm3/ : 3.1...3.7 Overflow valve 100 s: (2.9...3.9) : 2 417 413 011 cm3 : 0.8 Spread 100 s: (1.2) Overflow quantity min. 1/h: 160...170 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL 1st speed rpm : 325 Openina | travel mm : 1.40...1.60 pressure, bar : 207...210 2nd speed rpm : 450 travel mm : 3.30...3.70 Orifice plate 3rd speed rpm : 700 diameter mm : 0,6 travel mm : 7.90...8.30 4th speed rpm : 900 travel mm : 9.40...9.60 Test lines : 1 680 750 008 5th speed : 1050 rpm : 10.60...11.00 travel mm Outside diameter x Wall thickness FULL LOAD DELIV. AT FULL LOAD STOP x Length mm : 6.00x2.00x600 1st version (A) Injection pump setting values Speed rpm : 875 Insp. values in parentheses Aneroid pressure h: 1200 Set equal delivery quant. Del.quantity : 255.0...257.0 per values 1000 : (252.0...260.0) : 5.00 Spread cm3 BEGINNING OF DELIVERY 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 61...69

Testing:

1st rack travel in: 13.20 Speed rpm : 915...965 2nd rack travel in: 4.00

rpm : 1075...1085 Speed

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 8...16

Testing:

Speed : 275 THE ST. Minimum rack trave: 6.00 rpm : 340

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st: speed

st speed rpm : 875 Rack travel in m: 14.20...14.30

rpm : 510 2nd speed

Rack travel in m: 14.80...15.00

rpm : 575 3rd speed

Rack travel in m: 14.80...15.00

4th speed rpm : 450

Rack travel in m: 13.90...14.30

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 510 rpm hPa : 1200 Pressure

Rack travel mm : 14.80...15.00

Measurement

1/min: 510 Speed

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 370

Rack travel in m: 10.30...10.40 3rd pressure hPa : 760

Rack travel in m: 13.30...13.70

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 510
Del.quantity cm3/ : 334.0...340.0
1000 s: (331.0...343.0)
Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875 Del.quantity cm3/ : 199.0...201.0 \* 1000 s: (159.5...183.0)

Aneroid pressure h: rpm : 400 Speed

Del.quantity cm3/: 156.0...160.0

1000 s: (154.0...162.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 915...965

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 340 Rack travel in mm : 4.60...4.80 Del.quantity cm3/: 31.0...37.0 1000 s: (29.0...39.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only to the engine/nozzle-and-holder

assemblies on an injection-pump test

bench: setting for test equipment, check value for engine equipment.

Note remarks

Test sheet : UNI 9,5 i Edition : 26.06.92 Replaces : 06.91 Test oil : ISO-4113

Combination no. : 0 402 746 901

Injection pump

Pump designation: PES6P120A720RS7224 EP type number : 0 412 726 840

Governor

Governor design. : RQVZ75...1100PA975K

Governer no. : 0 421 815 266

Customer-spec. information Customer : IVECO-UNIC

Engine : 8460.41.406

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Openina 1 4 1

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.10...5.20 Prestroke mm

: (5.05...5.25) Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasina : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 275.0 2nd speed Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 3.2...3.8

100 s: (2.9...4.1)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1145 1st speed

: 10.30...10.50 travel mm

: 275 2nd speed rpm

: 1.30...1.50 travel mm

3rd speed rpm : 450

travel mm : 3.40...4.00

4th speed rpm : 750

travel mm : 5.90...6.30

5th speed rpm : 1350

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1140 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 234.0...239.0)

M18

Spread cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 115...123 Testing: 1st rack travel in: 11.40 Speed rpm: 1140...1150 2nd rack travel in: 4.00 Speed rpm : 1220...1250 4th rack travel in: 1350 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 65...73 Testing: Speed rpm : 100 Minimum rack trave: 6.40 rpm : 275 Rack travel in mm : 4.80...5.00 CONSTANT REGULATION rpm : 270...400 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 12.40...12.50 2nd speed rpm : 900 Rack travel in m: 12.30...12.60 3rd speed rpm : 700 Rack travel in m: 11.90...12.10 th speed rpm : 500 Rack travel in m: 11.20...11.50 4th speed 5th speed rpm : 350 Rack travel in m: 10.80...11.20 Aneroid/Altitude Compensator Test 1st version Setting Speed man : 900 hPa : 1200 Pressure : 12.40...12.50 Rack travel mm

Measurement Speed 1/min: 900 1st pressure hPa : -Rack travel in m: 7.40...7.60 2nd pressure hPa : 710 M19

Rack travel in m: 11.20...11.30 3rd pressure hPa : 400 Rack travel in m: 8.60...9.00 STARY CUT-OUT 1/min: 195 (215) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 900 Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0) Aneroid pressure h: 1200 : 500 rpm Del.quantity cm3/: 246.0...252.0 1000 s: (243.0...255.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm\_ : 100 Del.quantity cm3/: 150.0...180.0 1000 s: (146.0...184.0) LOW IDLE rpm : 275 Speed Rack travel in mm : 4.70...5.10 Del.quantity cm3/: 32.0...38.0 1000 s: (29.0...41.0) cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

Test sheet : UNI 9,5 i 1 Edition : 26.06.92 Replaces : 06.91

Test oil : ISO-4113

Combination no. : G 402 746 902

Injection pump

Pump designation : PES6P120A720RS7224

EP type number : 0 412 726 840

Governor

: RQV275...1100PA975-1 Governor design.

Governer no. : 0 421 815 267

Customer-spec. information Customer : IVECO-UNIC

Engine : 8460.41.320

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

**Opening** 

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.10...5.20 Prestroke mm

: (5.05...5.25)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.9 Rack travel in mm : 5.1...5.5 Del.quantity cm3/: 3.2...3.8

100 s: (2.9...4.1)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1145

travel mm : 10.30...10.50

2nd speed rpm : 275

: 1.30...1.50 travel mm

3rd speed : 450 rpm

3.40...4.00 travel mm 4th speed : 750 rpm

5.90...6.30 travel mm

5th speed : 1350 rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1140 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1200

Del.quantity : 207.0...214.0)

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 115...123

Testing:

1st rack travel in: 10.20

rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1200...1230 4th rack travel in: 1350 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 64...72

Testing:

Speed rpm : 100 Minimum rack trave: 6.80

Speed rpm : 275

Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

Speed rpm : 270...400

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.20...11.30

2nd speed rpm : 900

Rack travel in m: 10.70...10.90

3rd speed rpm : 700

Rack travel in m: 9.90...10.10

4th speed rpm : 400 Rack travel in m: 9.30...9.70

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 1100 hPa : 1200 Pressure

Rack travel mm : 11.20...11.30

Measurement

1/min: 1100 Speed

1st pressure hPa : -

Rack travel in m: 7.70...7.90

2nd pressure hPa : 600

Rack travel in m: 10.60...10.70

3rd pressure hPa : 420

Rack travel in m: 9.10...9.50

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 700 Speed

Del.quantity cm3/: 188.0...194.0 1000 s: (185.0...197.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 120.0...122.0

1000 s: (117.0...125.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 150.0...180.0

1000 s: (146.0...184.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm: 5.10...5.50 Del.quantity cm3/: 32.0...38.0 1000 s: (29.0...41.0)

Spread cm3 : 8.00

1000 s: (12.00)

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Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : UNI 9,5 i 2 : 26.06.92 Edition : 06.91 Replaces

Test oil : ISO-4113

Combination no. : 0 402 746 903

Injection pump

Pump designation : PES6P120A720RS7224

: 0 412 726 840 EP type number

Governor

Governor design. : RQV275...1100PA888-1

: 0 421 815 268 Governer no.

Customer-spec. information Customer : IVECO-UNIC

: 8460.41.160 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Incet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.10...5.20 Prestroke mm

: (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 11.80...11.90

Del.quantity cm3/: 22.4...22.6

100 s: (22.1...22.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 275.0 2nd speedi Rack travel in mm : 5.2...5.6 Del.quantity cm3/ : 3.0...3.6

100 s: (2.7...3.9)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1145 1st speed

: 10.10...10.30 travel mm

2nd speed rpm : 275

travel mm : 1.10...1.30

3rd speed rpm : 400

: 2.50...3.10 travel mm

: 750 4th speed rpm

: 5.50...5.90 travel mm

: 1350 5th speed rpm travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1150 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 224.0...229.0)

Spread cm3 : 5.00 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 117...125 Testing: 1st rack travel in: 10.60 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 66...74 Testina: Speed : 100 rpm Minimum rack trave: 6.90 Speed rpm : 275 Rack travel in ma : 5.3G...5.50 CONSTANT REGULATION Speed rpm : 270...400 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version rpm : 850 1st speed Rack travel in m: 11.80...11.90 2nd speed rpm : 1100 Rack travel in m: 11.60...11.80

3rd speed rpm : 700

Rack travel in m: 11.20...11.40 4th speed rpm : 400 Rack travel in m: 10.70...11.00 Aneroid/Altitude Compensator Test 1st version Setting Speed : 850 וווכן

hPa : 900 Pressure

: 11.80...11.90 Rack travel mm

Measurement

Speed 1/min: 850

1st pressure hPa : -

Rack travel in m: 8.10...8.30

2nd pressure hPa : 640

Rack travel in m: 10.90...11.00

3rd pressure hPa : 400

Rack travel in m: 8.90...9.20

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1100 Del.quantity cm3/ : 210.0...216.0 1000 s: (207.0...219.0)

Aneroid pressure h: 900 Speed rpm : 700

Del.quantity cm3/: 220.0...226.0

1000 s: (217.0...229.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 127.0...129.0 1000 s: (124.0...132.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.60

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 150.0...180.0

1000 s: (146.0...184.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm: 5.20...5.60 Del.quantity cm3/: 30.0...36.0 1000 s: (27.0...39.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.65...4.75 : (4.60...4.80) Note remarks Rack travel in mm : 18.00...21.00 : 1-- 5- 3- 6- 2- 4 Firing order Test sheet : RVI 9,8 o Edition : 03.04.92 : 07.91 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 746 908 Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6P120A320RS7232 EP type number : 0 412 726 846 1st speed rpm : 600Governor Governor design. : RQV275...1000PA1001 Rack travel in mm : 13.60...13.70 Governer no. : 0 421 813 931 Del.quantity cm3/: 26.1...26.3 Customer-spec. information Customer : RVI 100 s: (25.8...26.6) Engine : MIDR 062045 E/3 Spread cm3 : 0.51st version kW : 249.0 100 s: (0.9) : 2000 Rated speed rpm : 275.0 2nd speed TEST BENCH REQUIREMENTS Rack travel in mm: 5.3...5.7 Del.quantity cm3/: 2.9...3.3 Test oil 100 s: (2.6...3.6) inlet temp. °C : 38...42 Spread cm3 : 0.8 100 s: (1.2) Overflow valve : 1 419 992 198 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder rpm : 1070 1st speed assembly : 1 688 901 105 : 8.20...8.40 travel mm 2nd speed rpm : 275 : 1.10...1.50 Opening travel mm : 207...210 pressure, bar 3rd speed : 500 rom : 3.60...4.20 travel mm Orifice plate : 850 4th speed rpm diameter mm : 0,8 : 6.40...6.80 travel mm 5th speed rpm : 1400 : 11.00...12.00 travel mm Test lines : 1 680 750 089 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 : 8.00X2.50X600 rpm : 1165 x Length mm Rack travel in mm : 12.30...14.90 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP

BEGINNING OF DELIVERY

per values \_\_\_\_

Set equal delivery quant.

Aneroid pressure h: 1000 Del.quantity : 201.0...266.0) Test pressure, bar: 25...27

1st version Speed

rpm : 600

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 298...306

Testing:

1st rack travel in: 12.60

rpm : 1065...1075 Speed

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 243...251

Testing:

Speed : 175 rpm Minimum rack trave: 7.00 rpm : 275

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 310...430 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1000 Pressure

: 13.60...13.70 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.20...9.60

2nd pressure hPa : 520

Rack travel in m: 12.70...12.80 3rd pressure hPa : 200

Rack travel in m: 10.10...10.30

START CUT-OUT

Speed 1/min: 225 (245)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm : 1000 Speed

Del.quantity cm3/: 237.0...243.0

1000 s: (234.0...246.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 126.0...128.0

1000 s: (123.0...131.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1065...1075 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...170.0

1000 s: (136.0...174.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 5.30...5.70

Del.quantity cm3/: 29.0...33.0 1000 s: (26.0...36.0)

cm3 : 8.00

1000 s: (12.00)

Remarks:

Spread

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

M25

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : RVI 12,0 k : 24.07.92 Test sheet Edition : 06.91 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 909 Injection pump Pump designation : PES6P120A320RS7236 EP type number : 0 412 726 848 Governor Governor design. : RQV275...1000PA1001-Governer no. : 0 421 813 936 Customer-spec. information Customer : RVI Engine : MIDR 063540 J/3 1st version kW : 306.0 : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

: (4.45...4.65)

Rack travel in mm : (5.70...14.00)

Firing order : (-5.70...14.00) Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm . 600 Rack travel in mm : 13.60...13.70 Del.quantity cm3/: 30.1...30.3 100 s: (29.8...30.6) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 275.0 Rack travel in mm : 4.9...5.3 Del.quantity cm3/ : 2.7...3.3 100 s: (2.4...3.6) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1070 travel mm : 8.30...8.50 2nd speed : 275 rpm : 1.10...1.50 travel mm 3rd speed rpm : 500 : 3.60...4.20 rpm : 750 travel mm 4th speed travel mm : 5.70...6.10 5th speed rpm : 1400travel mm : 11.00...12.00 GUIDE SLEEVE POSTTION Control-lever position Degree: -1 rpm : 1150 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1000

: 4.50...4.60

Prestroke mm

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 301.0...303.0 Del.quantity 1000 : (298.0...306.0) Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 298...306

Testing:

1st rack travel in: 12.60 rpm : 1065...1075 Speed

2nd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1 Control Lever

position degrees: 242...250

Testing:

: 200 Speed rpm Minimum rack trave: 6.20 Speed rpm : 275

Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

rpm : 310...430 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed rom : 500 Pressure hPa : 1000

Rack travel mm : 13.60...13.70

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 9.50...9.90

2nd pressure hPa : 600

Rack travel in m: 12.60...12.70

3rd pressure hPa : 240

Rack travel in m: 9.60...10.00

START CUT-OUT

1/min: 225 (245) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 : 1000 Speed rpm

Del.quantity cm3/: 276.0...282.0 1009 s: (273.0...285.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 145.0...147.0 1000 s: (142.0...150.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1065...1075 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 150.0...170.0

1000 s: (146.0...174.0)

LOW IDLE

rpm : 275 Speed

Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 27.0...33.0 1000 s: (24.0...36.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

M27

## Note remarks

Test sheet

: MB

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 746 913x

Injection pump

Pump designation : PES6P120A720LS7237-1

EP type number

: 0 412 726 872

Governor

Governor design. : RQ300/1100PA1008-1

Governer no.

: 0 421 801 592

Cust, part no.

: 0200747802

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M447 hA

1st version kW

: 184.0

Rated speed

: 2200

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0.8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

Rack travel in mm : 20.00...21.00

: (5.15...5.35)

Firing order

: 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 19.6...19.8

100 s: (19.3...20.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1100

Aneroid pressure h: 1400

Del.quantity

: 196.0...198.0 1000 : (193.0...201.0)

cm3 : 5.00

1000 : (9.00)

RATED SPEED

Spread

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1220...1250

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.5

Testing:

Speed rpm : 200 Minimum rack trave: 8.30 Speed rpm : 300

Rack travel in mm: 6.40...6.60
Rack travel in mm: 2.00
Speed rpm: 370...410

Aneroid/Altitude Compensator Test

1st version

Settina

Speed rom: : 500 Pressure hPa : 1400

Rack travel mm : 13.60...13.80

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 600 Rack travel in m: 12.20...12.30

3rd pressure hPa : 950

Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400 Speed rpm : 800

Del.quantity cm3/: 199.0...203.0

1000 s: (196.0...206.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 139.0...141.0 1000 s: (136.0...144.0)

cm3 : 8.00 Spread

1000 s: (12.0)

**PREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.70

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 60.0...80.0 1000 s: (56.0...84.0)

Rack travel in mm : 11.70...12.10

, :

Remarks:

NO1

Note remarks

Test sheet

: MB

Edition

: 26,06,92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 916X

Injection pump

Pump designation : PES6P120A720LS7237-1

EP type number

: 0 412 726 872

Governor

Governor design. : RQ3DO/1100PA1010

Governer no.

: 0 421 801 596

Cust. part no.

: 0200747902

Customer

Customer-spec. information : MERCEDES-BENZ

Engine

: 0M447 hA

1st version kW

: 184.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)
Rack travel in mm : 20.00...21.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 19.6...19.8

100 s: (19.3...20.1)

cm3 : 0.5

100 s: (0.9)

rpm : 300.0

2nd speed Rack travel in mm: 6.2...6.8

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

Speed

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -2

rpm : 600

Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Del.quantity

rpm : 1100

Aneroid pressure h: 1400

: 196.0...198.0

1000 : (193.0...201.0)

cm3

: 5.00

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm: 20.0

Testina:

1st rack travel in: 12.70

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

Speed rpm : 1220...1250 4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.5

Testina:

rpm : 200 Speed Minimum rack trave: 8.30 rpm : 300 Speed

Rack travel in mm : 6.40...6.60

Rack travel in mm: 2.00 Speed rpm: 370...410

Ameroid/Altitude Compensator Test

1st version Settina

Speed : 500 rpm Pressure hPa : 1400

Rack travel mm : 13.60...13.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 600

Rack travel in m: 12.20...12.30

3rd pressure hPa : 950

Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Ameroid pressure h: 1400 Speed

rpm : 800

Del.quantity cm3/: 199.0...203.0

1000 s: (196.0...206.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: rpm : 500

Del.quantity cm3/: 139.0...141.0 1900 s: (136.0...144.0)

cm3 : 8.00 Spread 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0)

Remarks:

Note remarks

Test sheet

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 919X

Injection pump

Pump designation : PES6P120A720LS7237-1

EP type number

: 0 412 726 872

Governor

Governor design. : RQ300/1100PA1013-1

Governer no.

: 0 421 801 603

Cust. part no.

: 0220743402

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M447 hA

1st version kW

: 184.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.70x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 13.70...13.90

Del.quantity cm3/: 20.1...20.3

100 s: (19.8...20.6)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 300.0 2nd speed Rack travel in mm: 6.2...6.8

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1100

Aneroid pressure h: 1400 Del.quantity

: 201.0...203.0

cm3

1000 : (198.0...206.0) : 5.00

1000 : (9.00)

RATED SPEED

Spread

1st version

Setting point:

Speed rpm : 600 Rack travel in mm: 20.0

lesting:

1st rack travel in: 12.80

rpm : 1145...1160 Speed

2nd rack travel in: 4.00

rpm : 1220...1250 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.5

Testing:

Speed rpm : 200 Minimum rack trave: 8.30 npm : 303 Speed

Rack travel in mm : 6.40...6.60

Rack travel in mm: 2.00

rpm : 370...410 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : 1400 Rack travel mm : 13.70...13.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 600 Rack travel in m: 12.20...12.30 3rd pressure hPa : 950

Rack travel in m: 12.90...13.10

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 500

Del.quantity cm3/: 139.0...141.0

1000 s: (136.0...144.0)

Spread

cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 200.0...220.0

1000 s: (196.0...224.0)

Remarks:

NO5

Note remarks

Test sheet

: MB

Edition

: 26.06.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 746 923X

Injection pump

Pump designation : PES6P120A720LS7237

-11

EP type number

: 0 412 726 872

Governor

Governor design. : RQ300/1100PA1013-2

Governer no.

: 0 421 801 611

Cust. part no.

: 0220743502

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M447 hA

1st version kW

Rated speed

: 184.0

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow.

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm: 20.00...21.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 19.6...19.8

100 s: (19.3...20.1)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.8

Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 1100

Aneroid pressure h: 1400

Del.quantity

: 196.0...198.0

1000 : (193.0...201.0) : 5.00

Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rom : 600 Rack travel in mm: 20.0

Testina:

1st rack travel in: 12.70 rpm : 1145...1160 Speed

2nd rack travel in: 4.00 Speed

rpm : 1220...1250

4th rack travel in: 1300

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.5

Testina:

Speed rpm : 200 Minimum rack trave: 8.30 rpm : 300

Rack travel in mm : 6.40...6.60

Rack travel in mm: 2.00

rpm Speed : 370...410

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 mon Pressure hPa : 1400

: 13.60...13.80 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 600

Rack travel in m: 12.20...12.30

3rd pressure hPa : 950

Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400

rpm : 800 Speed

Del.quantity cm3/: 199.0...203.0

1000 s: (196.0...206.0)

cm3 : 8.00 Spread 1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 139.0...141.0 1000 s: (136.0...144.0)

cm3 : 8.00 Spread

1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.70

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Det.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

**NO7** 

Note remarks

Test sheet : RVI Edition : 30.04.92 Replaces : 02.92 Test oil : ISO-4113

Combination no. : 0 402 746 931

Injection pump

Pump designation : PES6P12OA32ORS7236 EP type number : 0 412 726 848

Governor

Governor design. : RQV275...1000PA1001-

2

Governer no. : 0 421 813 989

Customer—spec. information Customer : RVI

Engine : MIDR 063540 N/3

1st version kW : 283.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Openina |

pressure, bar : 207...210

Orifice plate

diameter mm : 0.8

Test lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60 : (4.45...4.65)

Rack travel in mm : 18.00...21.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 28.2...28.4

100 s: (27.9...28.7)

Spread cm3:0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 4.8...5.2 Del.quantity cm3/: 2.7...3.1

100 s: (2.4...3.4)

Spread cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1080

travel mm : 8.40...8.60 2nd speed rpm : 275

travel mm : 1.20...1.40

3rd speed rpm : 490 travel mm : 3.50...4.10

4th speed rpm: 775

travel mm : 5.90...6.30

5th speed rpm : 1450

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1190

Rack travel in mm : 11.90...14.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 600 Aneroid pressure h: 1000

NO8

: 282.0...284.0 Del.quantity 1000 : (279.0...287.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 297...305

Testing:

1st rack travel in: 12.20

rpm : 1065...1075 Speed

2nd rack travel in: 4.00

rpm : 1190...1220 Speed

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 243...251

Rack travel in mm: 8.2

Testing:

Speed rom Minimum rack trave: 6.50 rom Speed : 300

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 310...420

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom hPa : 1000 Pressure

Rack travel mm : 13.20...13.30

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.20...9.60

2nd pressure hPa : 480

Rack travel in m: 12.30...12.40

3rd pressure hPa : 240

Rack travel in m: 10.30...10.70

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

: 1000 rpm

Del.quantity cm3/: 260.0...266.0

1000 s: (257.0...269.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 166.0...168.0

1000 s: (163.0...171.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 1065...1075

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 145.0...175.0 1000 s: (141.0...179.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.80...5.20

Del.quantity cm3/: 27.0...31.0

1000 s: (24.0...34.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

: LIE

Edition

: 03.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 932

Injection pump

Pump designation : PES6P120A720RS7258

EP type number

: 0 412 726 862

Governor

Governor design. : ROV300...1050PA1035

Governer no.

: 0 421 813 995

Customer

Customer-spec. information : LIEBHERR

Engine

: D926Ti

1st version kW

Rated speed

: 220.0

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00 Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 1050

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm: 6.5...7.1 Del.quantity cm3/: 3.0...3.6

100 s: (2.7...3.9)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.70...2.20

travel mm

2nd speed rpm : 490

: 3.30...3.80 travel mm 3rd speed rpm : 780

travel mm

: 6.30...6.80

4th speed : 1120 rom

travel mm

: 10.30...10.80

5th speed 1320 rpm

travel mm

: 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1200

Rack travel in mm : 11.10...13.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 1050

Aneroid pressure h: 1500

Del.quantity : 207.0...212.0)

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 102...110

Testing:

1st rack travel in: 12.40

rpm : 1100...1110 Speed

2nd rack travel in: 4.00

Speed rpm : 1185...1215 4th rack travel in: 1300 Speed

Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever

position degrees: 68...76

Testing:

Speed rpm : 250

Minimum rack trave: 10.00

Speed rpm : 350 Rack travel in mm : 6.70...6.90

CONSTANT REGULATION

rpm : 350...450 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 700 hPa : 1500 Speed Pressure

Rack travel mm : 13.40...13.50

Measurement

Speed 1/min: 700

1st pressure hPa : -

Rack travel in m: 10.60...10.80

2nd pressure hPa : 1200

Rack travel in m: 12.90...13.00

3rd pressure hPa : 800

Rack travel in m: 11.10...11.30

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rom : 700

Speed

N11

Del.quantity cm3/: 154.0...156.0 1000 s: (151.0...159.0)

cm3 : 8.00Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40

Speed rpm : 1100...1110

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 165.0...195.0 1000 s: (161.0...199.0)

Remarks:

Note remarks

Test sheet : MAC

Edition : 31.07.92

Replaces

Test oil : ISO-4113

: 0 402 748 807 Combination no.

Injection pump

Pump designation: PES8P120A920/4LS7246

: 0 412 728 805 EP type number

Governor

Governor design. : RQV325...1000PA1018

-1K

: 0 421 815 292 Governer no.

Customer-spec. information Customer : MACK

Engine : EE9 530

1st version kW : 395.0 : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 011

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 160...170

Test nozzle holder

: 1 688 901 103 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0.7

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mn : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85

: (2.70...2.90)
Rack travel in mm : 12.00...14.00

: 1-2-7-8-4-5-6-3 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 29.3...29.5

100 s: (29.0...29.3)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 325.0

Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 2.4...3.0

100 s: (2.1...3.3)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 325 1st speed

: 1.30...1.60 travel mm

rpm : 450 2nd speed

: 2.80...3.20 travel mm

rpm : 900 3rd speed

: 7.50...7.90 travel mm

4th speed rpm : 1050

: 8.90...9.10 travel mm

rpm : 13005th speed

: 11.50...11.90 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1240

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP Speed 1/min : 1000 1st version 1st pressure hPa : -Rack travel in m: 9.90...10.30 2nd pressure hPa : 235 Rack travel in m: 11.30...11.40 Speed rpm : 500 Aneroid pressure h: 1200 Del.quantity : 293.0...295.0 1000 : (290.0...298.0) 3rd pressure hPa : 610 Rack travel in m: 14.40...14.80 : 6.00 Spread cm3 1000 : (10.00) START CUT-CUT RATED SPEED 1/min: 280 (290) Speed 1st version Control Lever FUEL DELIVERY CHARACTERISTICS position degrees: 62...70 Testing: 1st version 1st rack travel in: 15.30 Aneroid pressure h: 1200 rpm : 1045...1055 Speed rpm : 1000 Del.quantity cm3/ : 306.5...312.5 1000 s: (303.5...315.5) Speed 2nd rack travel in: 4.00 Speed rpm : 1230...1260 4th rack travel in: 1350 cm3 : 10.00 Spread rpm : 0.00...1.00Speed 1000 s: (14.0) : 950 Speed rom LOW IDLE 1 Del.quantity cm3/: 199.0...201.0 \* Control lever 1000 s: (186.0...213.5) position degrees: 10...18 Aneroid pressure h: rpm : 400 Speed Del.quantity cm3/: 184.5...188.5 1000 s: (181.5...191.5) Testina: Speed rom : 275 Minimum rack trave: 1.00 Speed rom : 325 Rack travel in m: : 5.60...5.80 **BREAKAWAY** CONSTANT REGULATION 1st version Speed rpm : 325...600 1mm rack travel less than TORQUE CONTROL full load rack tr: 15.30 Dimension a mm :? rpm : 1045...1055 Speed Torque control curve - 1st version 1st speed rom : 500 STARTING FUEL DELIVERY Rack travel in m: 13.60...13.70 2nd speed rpm : 1000 Rack travel in m: 16.30...16.50 Speed rpm : 100 Del.quantity cm3/: 150.0...190.0 1000 s: (146.0...194.0) 3rd speed rpm : 700 Rack travel in m: 14.10...14.50 4th speed rpm : 400 Rack travel in mm : 11.00...12.00 Rack travel in m: 13.00...13.40 LOW IDLE Aneroid/Altitude Compensator Test Speed rpm : 325 Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 24.0...30.0 1000 s: (21.0...33.0) 1st version Setting cm3 : 8.00 Spread Speed ווומה : 1000 1000 s: (12.00) Pressure hPa : 1200 Rack travel mm : 16.30...16.50 Remarks: Measurement

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:
Sliding-sleeve position = 37.0 mm

\* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 24.07.92 Replaces Test oil : 1SO-4113 Combination no. : 0 403 246 031A Injection pump Pump designation : PES6MW100/720RS1515 EP type number : 0 413 206 013 Governor Governor design. : RQV300...1300MW125-1 Governer rio. : 0 420 083 258 Customer-spec, information Customer : MB-NFZ Engine : 0/366LA 1st version kW : 127.0 Rated speed : 2600 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina pressure, bar : 172...175 Test lines : 1 680 750 089 Outside diameter x Wall thickness : 8.00x2.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 21.00...0.00 N15

Firing order : 1-5- 3- 6- 2- 4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1300 Rack travel in mm : 11.50...11.60 Del.quantity cm3/: 9.6...9.8 100 s: (9.4...10.0) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 300.0Rack travel in mm : 3.9...4.2 Del.quantity cm3/ : 1.0...1.4 100 s: (0.7...1.6) Spread cm3 : 0.3 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1350 travel mm : 7.80...8.20 2nd speed rpm : 880 : 3.70...4.00 travel mm rpm : 500 3rd speed

: 1.70...2.30 travel mm rpm : 300 4th speed : 0.90...1.30 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 1300 Aneroid pressure h: 10W Del.quantity : 96.0...98.0 1000 : (94.0...100.0) : 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 107...115

Testing: 1st rack travel in: 10.50

Speed rpm : 1340...1350 2nd rack travel in: 4.00 rpm : 1430...1460 Speed 4th rack travel in: 1550 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 68...76 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 4.0 Testing: Speed rpm : 200 Fininum rack trave: 5.00 Speed rpm : 300 Rack travel in mm : 3.90...4.20 Aneroid/Altitude Compensator Test 1st version Setting Speed חסח : 500 Pressure hPa : -Rack travel mm : 8.70...8.90 Measurement Speed 1/min: 500 1st pressure hPa : 300 Rack travel in m: 9.40...9.60 2nd pressure hPa : 500 Rack travel in m: 10.80...11.00 3rd pressure hPa : 1000 Rack travel in m: 11.50...11.60 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 750 Del.quantity cm3/: 89.0...92.0 1000 s: (86.5...94.5) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 35.0...37.0 1000 s: (33.0,..39.0)

1st version 1mm rack travel less than full load rack tr: 10.50 Speed **rpm** : **1340**...1350 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 115.0...125.0 1000 s: (112.0...128.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 3.90...4.20 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

BREAKAWAY

Note remarks

Test sheet : MB 6,1 I 1 : 31.07.92 Edition : 06.92 Replaces : ISO-4113 Test oil

Combination no. : 0 403 246 032

Injection pump

Pump designation : PES6MW100/720RS1515

EP type number : 0 413 206 013

Governor

Governor design. : RQV300...1300MW125-5

: 0 420 083 285 Governer no.

Customer-spec, information Customer : MB-NFZ

Engine : 01/366LA

1st version kW : 142.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 889 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 21.00...0.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - \*

BASIC SETTING

1st speed rom : 1300

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 4.2...4.4 Del.quantity cm3/: 1.0...1.4

100 s: (0.7...1.6)

Spread sm3 : 0.3 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

: 8.60...9.00 travel mm 2nd speed rpm : 880

: 4.90...5.10 travel mm

3rd speed : 500 rpa

travel mm : 2.70...3.30

: 300 4th speed rpm

: 1.20...1.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1100

Del.quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread

cm3 : 3.50 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 120...128

Testing:

1st rack travel in: 11.50

rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1450...1480 Speed 4th rack travel in: 1550 Speed rpm : 0.60...1.00 LOW IDLE 1 Control lever position degrees: 62...70 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 4.3 Testing: Speed rpm : 200 Minimum rack trave: 5.00 rpm : 300 Rack travel in mm: 4.20...4.40 Aneroid/Altitude Compensation Test 1st version Setting Speed : 500 mon Pressure hPa : -: 9.00...9.10 Rack travel mm Measurement 1/min : 500 Speed 1st pressure hPa : 250 Rack travel in m: 9.70...9.90 2nd pressure hPa : 500 Rack travel in m: 11.40...11.60 3rd pressure hPa : 1100 Rack travel in m: 12.50...12.60 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 rpm : 750 Del.quantity cm3/: 103.0...106.0 1000 s: (100.5...108.5) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 35.0...37.0 1000 s: (33.0...39.0)

1st version 1mm rack travel less than full load rack tr: 11.50 **rpm** : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 115.0...125.0 1000 s: (112.0...128.0)

LOW IDLE

Speed

Speed rpm : 300 Rack travel in mm : 4.20...4.40 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

**BREAKAWAY** 

Note remarks

Test sheet

Edition

: 31.07.52

Replaces

Test oil

: ISO-4113

Combination no. : 0 403 246 032A

Injection pump

Pump designation: PES6MW100/720RS1515

EP type number : 0 413 206 013

Governor

Governor design. : RQV300...1300Mv125-2

Governer no.

: 0 420 083 259

Customer-spec. information Customer

: MB-NFZ

Engine

: CM3661\_A

1st version kW

Rated speed

: 142.0 : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening.

pressure, bar

: 172...175

Test Lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 21.00...0.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - \*

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm : 1300

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

Spread

Spread

cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed

Rack travel in mm: 4.2...4.4 Del.quantity cm3/: 1.0...1.4

100 s: (0.7...1.6)

cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1350 1st speed

travel nm : 7.80...8.20

2nd speed ipm : 880

travel mm : 3.80...4.00

3rd speed rpm : 500

: 1.70...2.30 travel mm rpm : 300

4th speed

: 0.90...1.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1380

Rack trayel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1300

Aneroid pressure h: 1100

: 110.0...112.0 Del.quantity

1000 : (108.0...114.0)

cm3

: 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 107...115

Setting point:

Speed rpm : 1380 Rack travel in mm: 16.5

Testing:

1st rack travel in: 11.50

rpm : 1340...1350 Speed

2nd rack travel in: 4.00

rpm : 1430...1460 Speed

4th rack travel in: 1550

mom : 0.00...1.00 Speed

LOW IDLE 1 Control Lever

position degrees: 68...76

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 4.3

Testing:

Speed : 200 rom Minimum rack trave: 5.00 rpm : 300

Rack travel in mm : 4.20...4.40

Aneroid/Altitude Compensator Test

1st version Setting

Speed Pressure

: 500 rom hPa : -

Rack travel mm : 9.00...9.10

Measurement

1/min: 500 Speed

1st pressure hPa : 250

Rack travel in m: 9.70...9.90

2nd pressure hPa : 500

Rack travel in m: 11.40...11.60

3rd pressure hPa : 1100

Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100 rpm : 750 Speed

Del.quantity cm3/: 100.0...103.0

1000 s: (98.0...105.0)

cm3 : 5.00 Spread 1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 35.0...37.0 1000 s: (33.0...39.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.50

rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 115.0...125.0 1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.20...4.40 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

Note remarks

Test sheet

Edition

: 24.07.92

Replaces Test oil : 03.92

: ISO-4113

Combination no. : 0 403 246 033

Injection pump

Pump designation : PES6MW100/720RS1511

EP type number Governor

: 0 413 206 011

Governor design. : RQV300...1300MW125-6

Governer no. : 0 420 083 286

Customer-spec. information Customer

: MB-NFZ

Engine

: 0M366LA

1st version kw

: 156.0

Rated speed

: 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

**Opening** 

pressure, bar

: 172...175

Test Lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 21.00...0.00

N21

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

Spread

cm3 : 0.3

100 s: (0.6)

2nd speed

rpm : 300.0

Rack travel in mm: 4.1...4.3

Del.quantity cm3/: 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1350

travel mm : 8.60...9.00 2nd speed rpm

: 880

travel mm

: 4.90...5.10

3rd speed travel mm ripm: : 500 : 2.70...3.30

4th speed

: 300

travel mm

: 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

rpm

1st version

Speed

rpm : 1300

Aneroid pressure h: 1400 Del.quantity

: 118.0...120.0 1000 : (116.0...122.0)

cm3

: 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 108...116

Testing:

Spread

1st rack travel in: 11.60

: 1340...1350 Speed rom

2nd rack travel in: 4.00

Speed rpm : 1435...1465 4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 68...76

Setting point w/out burger spring

rpm : 300 Rack travel in mm: 4.2

Testing:

Speed : 200 rom Minimum rack trave: 5.00 rpm : 300

Rack travel in mm : 4.10...4.30

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom Pressure hPa : -

Rack travel mm : 5.80...6.00

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : 300

Rack travel in m: 6.60...6.80

2nd pressure hPa : 900

Rack travel in m: 11.10...11.30

3rd pressure hPa : 1400

Rack travel in m: 12.60...12.70

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400 rpm : 750 Speed

Del.quantity cm3/: 111.5...114.5 1000 s: (109.0...117.0)

cm3 : 5.00

Spread 1000 s: (7.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 35.0...37.0

1000 s: (33.0...39.0)

BREAKAWAY

N22

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 115.0...125.0

1000 s: (112.0...128.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.10...4.30 Del.quantity cm3/: 10.0...14.0

1000 s: (7.5...16.5) cm3 : 3.50

Spread

1000 s: (5.50)

Remarks:

Note remarks

Test sheet

: MB

Edition

: 24.07.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 403 246 033A

Injection pump

Pump designation : PES6MW100/720RS1511

EP type number

: 0 413 206 011

Governor

Governor design. : RQV300...1300MW125

Governer no.

: 0 420 083 257

Customer-spec. information Customer

: MB-NF7

Engine

: 0M366LA

1st version kW

: 156.0

Rated speed

: 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 5.20...5.30

Rack travel in mm: 21.00...0.00

: (5.15...5.35)

Phasing

: 0-60-120-180-240-300

: 1-5-3-6-2-4

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Firing order

BASIC SETTING

1st speed

rpm : 1300

Rack travel in mm : 12.60...12.70

Del.quentity cm3/: 11.8...12.0

100 s: (11.6...12.2)

Spread

2nd speed

Spread

cm3 : 0.3

100 s: (0.6)

rpm : 300.0

Rack travel in mm: 4.1...4.3

Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

: 7.80...8.20

travel mm

2nd speed rpm : 880 travel mm : 3.70...4.30

3rd speed rpm : 500

travel mm : 1.70...2.30

rpm : 300 4th speed

: 0.90...1.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1380

Rack travel in mm: 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1300

Aneroid pressure h: 1100

Del.quantity : 118.0...120.0

1000 : (116.0...122.0) : 3.50

cm3

1000 : (6.00)

RATED SPEED

Spread

1st version Control lever position degrees: 107...115 Testing: 1st rack travel in: 11.60 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 Speed rpm : 1435...1465 4th rack travel in: 1550 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 68...76 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 4.2 Testing: Speed rpm : 200 Minimum rack trave: 5.00 Speed rpm : 300 Rack travel in mm : 4.10...4.30 Aneroid/Altitude Compensator Test 1st version Setting Speed mom : 500 Pressure hPa:-Rack travel mm : 7.10...7.20 Measurement Speed 1/min : 500 1st pressure hPa : 300 Rack travel in m: 8.80...9.00 2nd pressure hPa : 500 Rack travel in m: 10.10...10.30 3rd pressure hPa : 1100 Rack travel in m: 12.60...12.70 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1100 rpm : 750 Del.quantity cm3/: 111.5...114.5 1000 s: (109.0...117.0) cm3 : 5.00 Spread

1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 41.0...43.0
1000 s: (39.0...45.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.60 Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 115.0...125.0 1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.10...4.30
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 24.07.92 Edition Replaces Test oil : ISO-4113 Combination no. : 0 403 444 140 Injection pump Pump designation: PES4MW100/720RS1151 EP type number : 0 413 404 104 Governor Governor design. : RQV300...1200MW50-30 : 0 420 083 283 Governer no. Customer-spec. information Customer : MB-NFZ Engine : 0M364A 1st version kW : 77.0 Rated speed : 2400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test Lines ·: 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00X2.50X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY

Firing order : 1-3-4-2 Phasing : 0-90-180-270 Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ BASIC SETTING 1st speed rom: 1200 Rack travel in mm : 10.80...10.90 Del.quantity cm3/: 8.6...8.8 100 s: (8.4...9.0) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 300.0Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1350 : 8.50...8.90 travel mm 2nd speed rpm : 1250 travel mm : 7.60...7.80 3rd speed rpm : 500 : 2.70...3.30 travel mm : 300 4th speed rpm travel mm : 1.20...1.60 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1200 Aneroid pressure h: 700 Del.quantity : 86.0...88.0 1000 : (84.0...90.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 105...113

Testing:

1st rack travel in: 9.80

Prestroke mm

Test pressure, bar: 30...32

Rack travel in mm : 9.00...12.00

: 3.70...3.80 : (3.65...3.85)

rpm : 1250...1260 Speed 2nd rack travel in: 4.00 Speed rpm: 1350...1380 4th rack travel in: 1450 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 75...83 Setting point w/out bumper spring rpm : 300 Rack travel in mm : 6.4 Testina: Speed rpm : 200 Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 6.30...6.50 TORQUE CONTROL Dimension a nm : 0.70 Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 10.80...10.90 2nd speed rpm : 600 Rack travel in m: 11.50...11.60 3rd speed rpm : 1100 Rack travel in m: 11.00...11.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : -Rack travel mm : 9.50...9.60 Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 10.00...10.20 2nd pressure hPa : 450 Rack travel in m: 11.20...11.40 3rd pressure hPa : 700 Rack travel in m: 11.50...11.60 START CUT-OUT Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm : 600

Del.quantity cm3/: 79.0...82.0 1000 s: (76.5...84.5) Spread cm3 : 5.001000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 46.0...48.0 1000 s: (44.0...50.0)

BREAKAWAY

1st version 1mm rack travel less than full load rack tr: 9.80

Speed rpm : 1250...1260

STARTING FUEL DELIVERY

rpm : 100 Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 4.00...4.10 : (3.95...4.15) Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order Test sheet : FIA 8,1 D Edition : 24.07.92 : 09.91 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 403 446 249 Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/720RS1197 EP type number : 0 413 406 185 1st speed rpm : 1350Governor Governor design. : RQV325...1350MW109K Rack travel in mm: 14.00...14.10 : 0 420 083 997 Governer no. Del.quantity cm3/: 10.1...10.3 Customer-spec. information Customer : IVECO-FIAT 100 s: (9.9...10.5) Engine : 8060.45.6000 cm3 : 0.3Spread 1st version kW : 169.0 100 s: (0.6) Rated speed : 2700 2nd speed rpm : 325.0 Rack travel in mm : 7.7...7.9 TEST BENCH REQUIREMENTS Del.quantity cm3/: 2.5...2.9 Test oil 100 s: (2.2...3.1) inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 457 413 010 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1400assembly : 1 688 901 101 : 10.00...10.40 travel mm : 825 2nd speed rpm Opening : 4.90...5.10 travel mm pressure, bar : 207...210 3rd speed : 400 rpm travel mm : 2.90...3.50 Orifice plate : 325 4th speed rpm diameter mm : 0,6 : 1.50...1.90 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 014 1st version Outside diameter Speed rpm : 1350 x Wall thickness Aneroid pressure h: 850 : 6.00x2.00x600 x Length mm Del.quantity : 101.0...103.0 1000 : (99.0...105.0) (A) Injection pump setting values : 3.50 cm3 Spread Insp. values in parentheses 1000 : (6.00) Set equal delivery quant. per values RATED SPEED

1st version

Control lever

position degrees: 117...125

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Testing: 1st rack travel in: 13.00 rpm : 1420...1430 Speed 2nd rack travel in: 4.00 rpm : 1520...1550 Speed 4th rack travel in: 1650 Speed rpm : 0.00...1.00LOW TOLE 1 Control lever position degrees: 78...86 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 7.8 Testina: Speed rpm : 200 Minimum rack trave: 10.00 : 325 rpm Rack travel in mm: 7.70...7.90 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1350 Rack travel in m: 14.00...14.10 and speed rpm : 1200 Rack travel in m: 13.60...13.80 2nd speed 3rd speed rpm : 1000 Rack travel in m: 13.20...13.50 rpm : 700 4th speed Rack travel in m: 13.30...13.50 Aneroid/Altitude Compensator Test 1st version Settina Speed rom : 500 hPa : -Pressure Rack travel mm : 11.20...11.30 Measurement  $1/\min : 500$ Speed 1st pressure hPa : 350 Rack travel in m: 11.90...12.00 2nd pressure hPa : 550
Rack travel in m: 12.80...13.10
3rd pressure hPa : 850 Rack travel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 850 Speed rpm : 1200

Del.quantity cm3/: 100.5...103.5 1000 s: (98.0...106.0) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 79.0...81.0 1000 s: (77.0...83.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rpm : 1420...1430 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 55.0...75.0 1000 s: (52.0...78.0) LOW IDLE

Remarks: